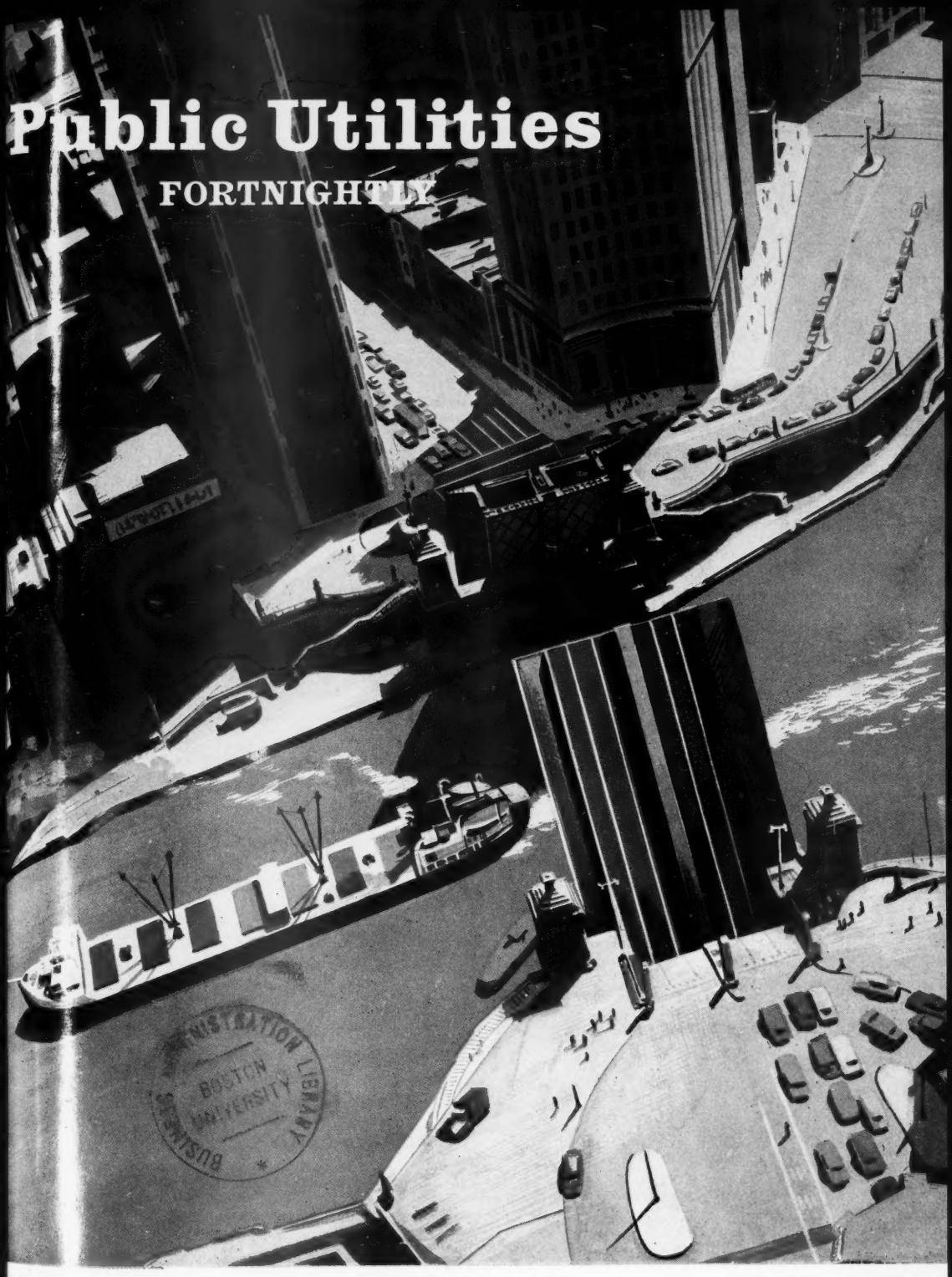
Public Utilities

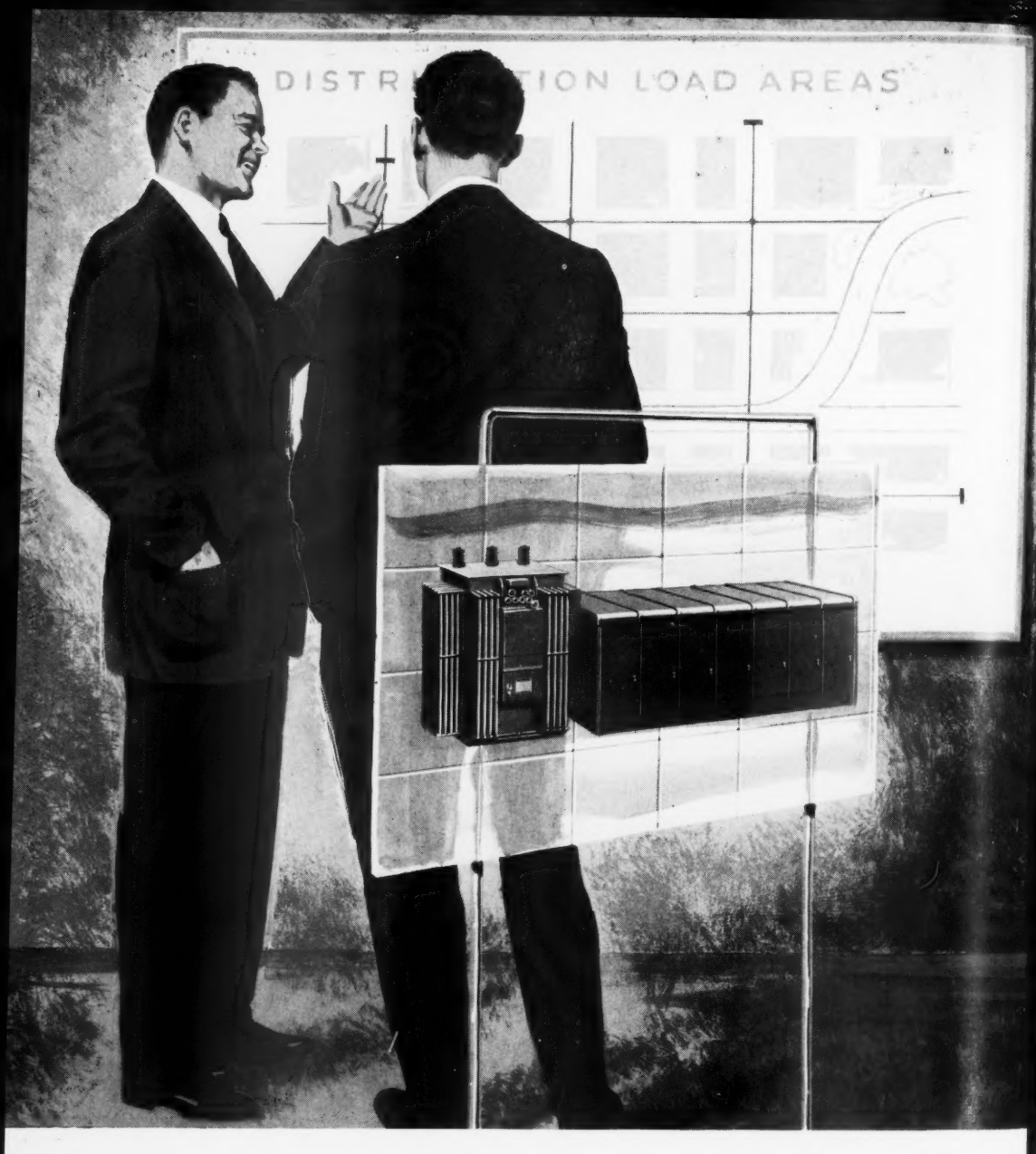
FORTNIGHTLY



EETINGS — 25TH EEI ANNUAL CONVENTION, JUNE 3-5, 1957 CHICAGO, ILLINOIS

The power industry looks to the future with strong faith in our free institutions

JUNE 6, 1957



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FORTNIGHTLY

VOLUME 59 JUNE 6, 1957 NUMBER 12

ARTICLES

FEATURE SECTIONS

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Philo Plant of Ohio Power Company on American Gas & El
System. Stack in front is for the new Supercritical Unit.

B&W's Universal Pressure Steam Generator

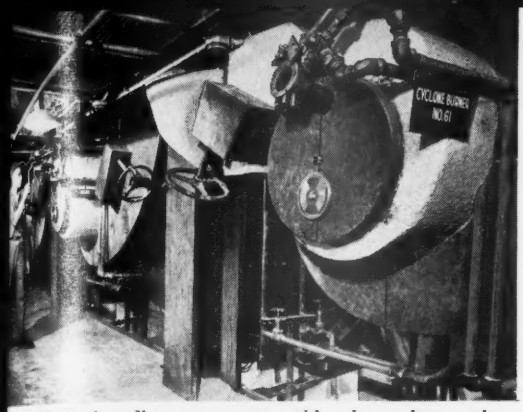
Helps Philo Plant Open the Way to New Economies in Steam-Electric Generatio

Generating history is being made at the Philo Plant of the Ohio Power Company on the American Gas & Electric System. Here, America's first commercial supercritical pressure steam-electric unit is in operation, probing the frontiers for new economies in the production of energy.

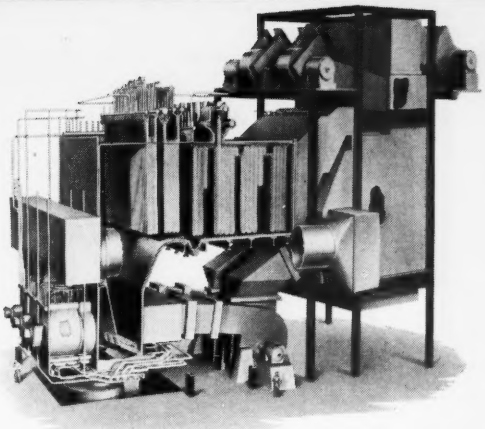
A Symbol of the Vision and progressiveness of America's public utilities and their suppliers, Philo is a landmark in engineering history. It is the result of years of engineering, research, and development that solved the many problems which had stood in the way of greater plant efficiency that comes with the hig possible combination of pressure and temperatur

The Problems Solved included the very difficult of feedwater chemistry, of heat transfer and contr internal deposits, metallurgy for higher tempera combined with higher pressures, and developme control and operating techniques.

Philo's Supercritical Unit, with a turbo-gene operating at 4500 psi and 1150F, is producing 120,000 kw, in the same space and using 45 per less fuel per kwhr than the 40,000 kw unit it repl

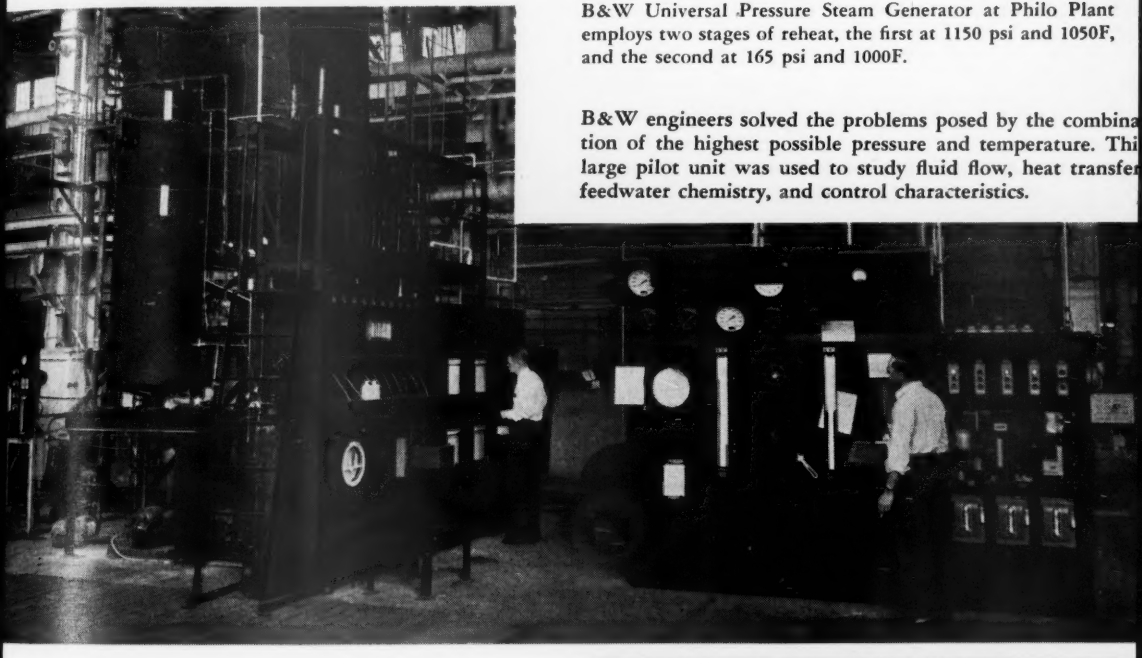


ee B&W Cyclone Furnaces assure rapid and complete combus- with minimum fly ash discharge and maintenance.



B&W Universal Pressure Steam Generator at Philo Plant employs two stages of reheat, the first at 1150 psi and 1050F, and the second at 165 psi and 1000F.

B&W engineers solved the problems posed by the combina tion of the highest possible pressure and temperature. Thi large pilot unit was used to study fluid flow, heat transfe feedwater chemistry, and control characteristics.



Two More **B&W** Universal Pressure Steam Gen- tors are now being built for The American Gas & ctric System. Together these will produce 900,000 —enough to supply residential power for a city of 00,000. Like Philo, they will continue to push ward this new frontier in steam generation.

Nearly a **Century** of B&W leadership in steam eration stands behind these achievements. The cock & Wilcox Company, Boiler Division, 161 42nd Street, New York 17, N. Y.

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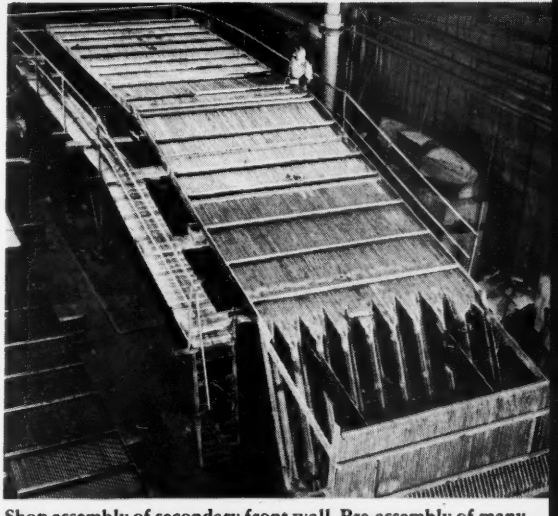
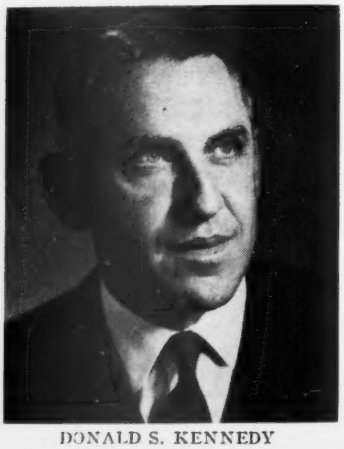


Shop assembly of secondary front wall. Pre-assembly of many components for the Universal Pressure Steam Generator greatly speeded field erection.

Pages with the Editors

FOLLOWING our annual custom, this issue of PUBLIC UTILITIES FORTNIGHTLY has been organized so as to be of special interest to our readers in the electric utility industry, many of whom are gathering about this time in Chicago for the twenty-fifth annual convention of the Edison Electric Institute. We are privileged to have as the opening feature of this issue an article especially written for this publication by the president of the Edison Electric Institute, DONALD S. KENNEDY, chairman of the board and president of the Oklahoma Gas & Electric Company since 1949.

MR. KENNEDY is a native of Rushville, Indiana. He was educated in Indianapolis and attended Butler University. He is also a graduate of the University of Arizona ('23) with a degree in accounting and economics. He joined the Oklahoma Gas & Electric Company in the year of his graduation as a bookkeeper. He rose by successive promotions to the post of vice president, treasurer, director, executive vice president, and finally president and chairman. In addition to his activity in the affairs of the electric utility industry, he has been very interested in numerous trade and business organizations in Oklahoma where he is a member of the Oklahoma Economic Development Committee.



DONALD S. KENNEDY

FRED A. SEATON

* * * *

TEAMWORK is the keynote in the article prepared for PUBLIC UTILITIES FORTNIGHTLY (beginning on page 798) by the HONORABLE FRED A. SEATON, Secretary of Interior. SECRETARY SEATON is a native of the District of Columbia, but he has spent most of his life in Nebraska and Kansas. He attended Kansas State College, from which he received an honorary Doctor of Laws degree in 1955. His primary interest before becoming a member of the Eisenhower administration was in the publishing and radio business in Nebraska, Kansas, South Dakota, Wyoming, and Colorado. He calls Hastings, Nebraska, his home, where he publishes the *Hastings Daily Tribune*. In 1951 he was appointed to the U. S. Senate to fill the vacancy left by the passing of Nebraska's Senator Kenneth S. Wherry. He also served as Assistant Secretary of Defense (1953) and administrative assistant to the President (1955). He was appointed the thirty-sixth Secretary of Interior on May 28, 1956.

* * * *

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our contributors to this issue. He is EDWIN VENNARD, vice president and managing director, whose article on "The Investor's Rôle in Preserving American Freedom" begins on page 804. Born in New Orleans, he is a graduate of Tulane University (BS, '24) and joined the General Electric Company at Schenectady, New York, where he was given an advance course in electrical engineering. He started in the electric utility business in 1926 as a power sales engineer for the Gulf States Utilities Company, and he later became general commercial manager for the Southwestern Gas & Electric Company at Shreveport, Louisiana. He accepted a post in the rate department of the Middle West Utilities Company in 1933 and became vice president in charge of rates, new business, advertising, and public relations of the successor organization —the Middle West Service Company— a post which he held until his appointment to the EEI in 1956.

* * * *

GWILYM A. PRICE, chairman and president of the Westinghouse Electric Corporation, whose article on partnership in industrial research begins on page 812, was born in Canonsburg, Pennsylvania, in 1895. He is a graduate of the University of Pittsburgh (LLB, '17) and practiced law and banking in Pittsburgh until his election as vice president of Westinghouse in 1943. He became president in 1944 and chairman in January, 1956. He stresses industrial research and development.

EUGENE S. LOUGHLIN

EDWIN VENNARD

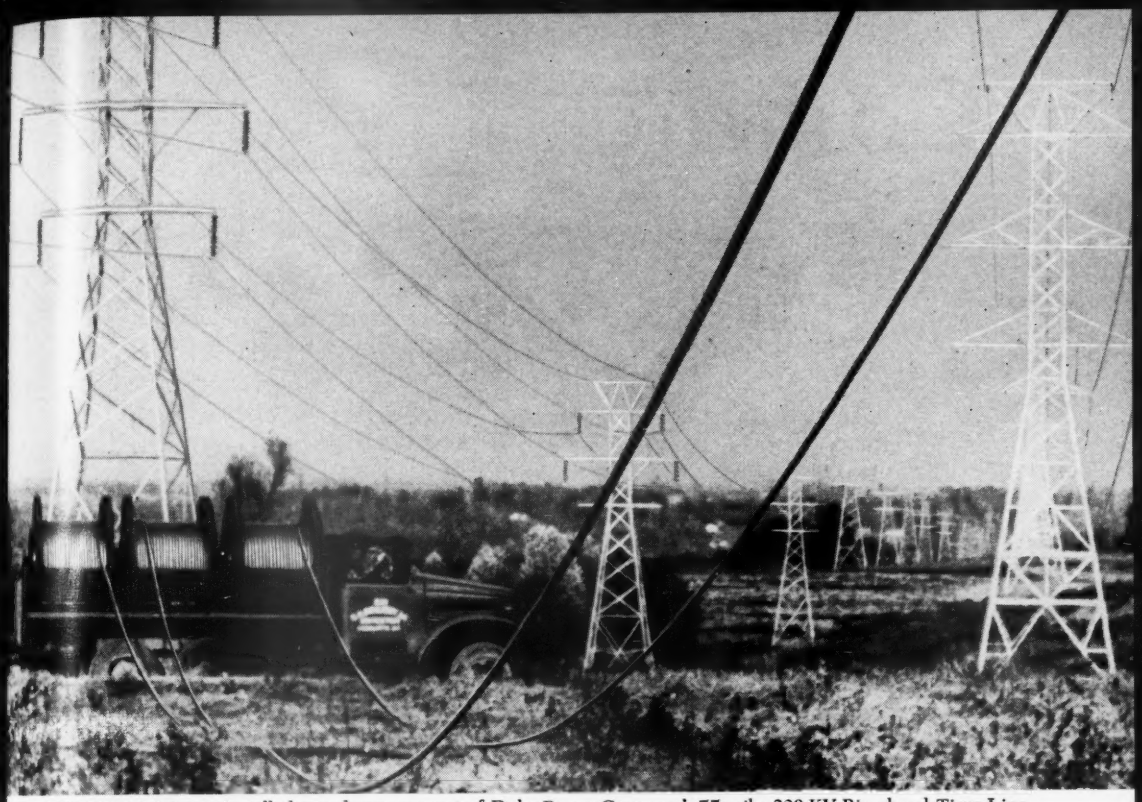
EUGENE S. LOUGHLIN, chairman of the Connecticut Public Utilities Commission, whose article on bringing the Holding Company Act up to date begins on page 819, is a native New Englander. He graduated from Holy Cross College (BA) and received his Master's degree in business administration from Harvard College, at which he specialized in accounting, corporate finance, and statistical analysis. His first business experience was with a large New York security house, after which he headed the city government of Greenwich, Connecticut. He was appointed to the Connecticut commission in 1942 and first elected chairman of that body in 1945. He has been very active in the affairs of the National Association of Railroad and Utilities Commissioners and served as its president from November 14, 1952, to September 24, 1953.

* * * *

G. T. KELLOGG, whose article on air conditioning begins on page 829, is a member of the staff of the Air-Conditioning and Refrigeration Institute of Washington, D. C., the trade association of that industry. He started in the newspaper business in his Iowa home town and came to Washington in 1930 as a reporter for *The Evening Star*.

THE next number of this magazine will be out June 20th.

The Editors



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(June 20, 1957, issue)

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INFLATION AND UTILITY FINANCING AND REGULATION

Fergus J. McDiarmid, vice president in charge of investments, The Lincoln National Life Insurance Company, Fort Wayne, Indiana, gives us a very carefully reasoned critique of the prevailing attitude towards rate making for electric and other utilities by regulators. He pictures inflation as a robber of the investor and as the enemy of the consumer, and the responsible villain for unfair regulation, based on original cost and the presumption of a stable dollar.

THE FUTURE OF INTRAURBAN SUBURBAN TRANSIT

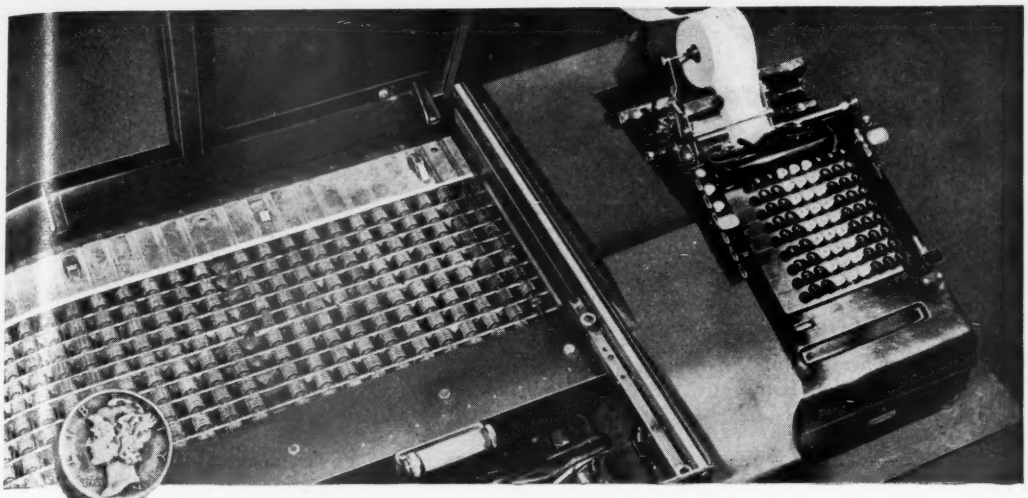
Colonel Sidney H. Bingham (Ret.), nationally known consultant on transit matters and former chairman of the New York City Board of Transportation, makes some practical suggestions of interest to those who must face the problem of continuing transit operations in our metropolitan areas. He suggests improvement in traffic analysis and forecasting of transit movement on a time and area basis. He discusses the consequences of decentralization of our cities and the establishment of suburban and satellite communities. Recognizing that mass transportation is the only alternative of continued municipal growth, he deals with the alternatives of supporting mass transportation on a stand-by basis or developing it to the status of a full-time indispensable service with necessary restriction on private vehicular traffic.

WHO'S BUILDING WHAT DAM?

Kenneth McCord, of the public relations department of the Washington Water Power Company, gives us an up-to-date article on dam building in the Pacific Northwest. Reading the various news items and editorials about the controversy over power development in the Pacific Northwest, the impression might be gained that the whole region is blanketed by various dams being built by various groups and interests. True, the Pacific Northwest is in need of more power, and this potential shortage has been brought on by the very conflict of interest which gives rise to the controversies in the area. Actually, there are power dams and big ones being built. This author has checked on all of them and gives us a project-by-project description of the more local partnership programs that somehow do not get into the newspapers because they are proceeding quietly and efficiently.

★

Also . . . ***Special financial news, digests, and interpretations of court and commission decisions, general news happenings, reviews, Washington gossip, and other features of interest to public utility regulators, companies, executives, financial experts, employees, investors, and others.***



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Remarkable Remarks

"There never was in the world two opinions alike."
—MONTAIGNE

M. S. RUKEYSER
Columnist.

"The key to success lies in giving more than lip service to the principles of competition."

HAROLD S. VANCE
Member, Atomic Energy Commission.

"There is overoptimism, not as to the dimensions of the potential benefits of nuclear energy, but as to the time it will take to realize them."

EDITORIAL STATEMENT
Los Angeles Times.

"Confidence, of course, is a mental attitude; and an administration devoted to 'soaking the rich' and 'cracking down' on business does not inspire it."

JAMES R. KILLIAN, JR.
President, Massachusetts Institute of Technology.

"We cannot have strong scientific and engineering education without recognizing the requirements for great and advancing strength in our over-all system of education."

GEORGE E. SOKOLSKY
Columnist.

"The worst characteristic of the income tax is that it encourages profligacy in administration and discourages enterprise among the people. Why work if nothing can be kept?"

DAVID SARNOFF
Chairman, Radio Corporation of America.

"To live and prosper long, a business must possess a hard, unchanging core of integrity—and, beyond that, a special talent for adjusting to new conditions. In the years ahead, these qualities will be needed as never before."

HAROLD WILLIS DODDS
President, Princeton University.

"The more one considers the future of higher education in America, the more does one generate a concern regarding the need for improved communication between the world of scholarship and the world of affairs. Education includes the freedom to make mistakes and to learn to accept responsibility for them."

HERBERT HOOVER
Former President of the United States.

"Today the greatest issue in America and all mankind is the encroachments of government to master our lives. . . . Our social and economic system is based upon free enterprise regulated to prevent monopoly and unfair competition. The state should only undertake business or public improvement enterprises where they are greater than the people can undertake for themselves."

HAROLD BRAYMAN
Director, public relations department, E. I. du Pont de Nemours & Company.

"When the advocates of control wanted to build huge projects out of tax money for the benefit of a special geographical group, they told those people that they would, for example, be able to sell power cheaper than private companies could. And they tried to spread the local geographical interest to a national interest by telling people that this would provide a 'yardstick' which would force cheaper power all over the nation. Again, an appeal to personal interest."

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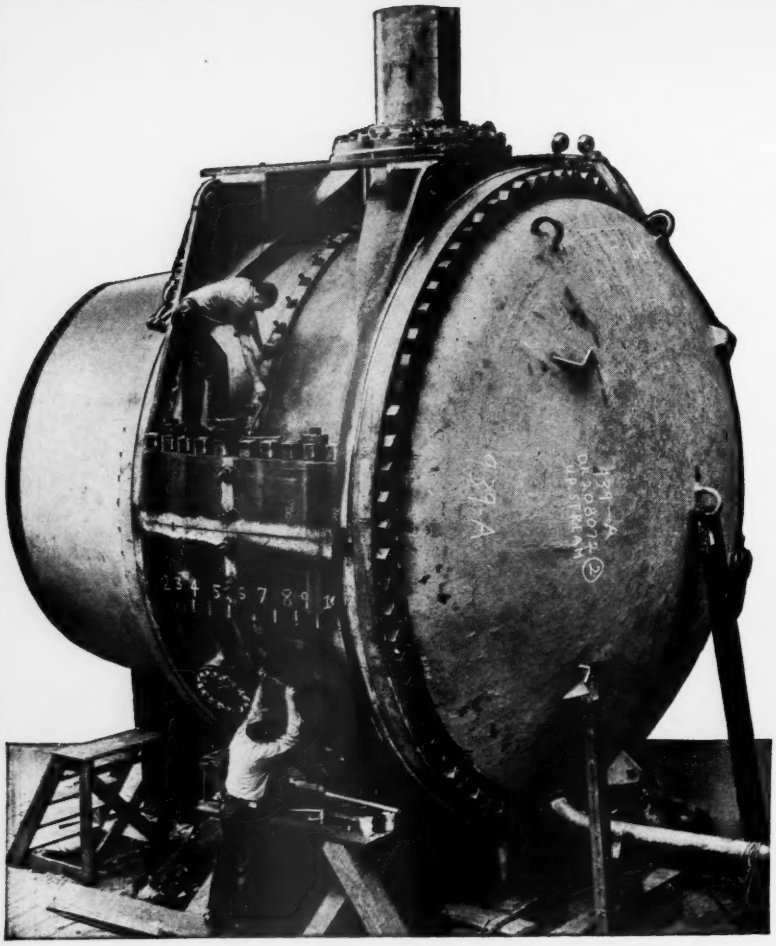

This 16-Foot Butterfly Valve Illustrates the type of work which Newport News takes in stride. Newport News built 3 such valves, each weighing 446,000 lbs., for the Ross Power Plant, Skagit Project, Department of Light, City of Seattle, Washington. Designed for a water flow of 3,620 cu. ft. per sec., and a hydrostatic pressure of 290 psi., these valves were shop tested by Newport News at 450 psi. They are hydraulically operated with oil at 1,500 psi. pressure. Shop tests assure speedy, trouble-free assembly of Newport News built equipment, on the site.

The TEST of a TITAN

Here is one of the largest high head butterfly valves ever built, undergoing a shop test at Newport News. If you had an opportunity to follow this unit from start to finish, you would see *first hand* how Newport News produces massive equipment *economically*. For economy is a basic advantage that results from Newport News' high integration of skill and production facilities.

Large engineering and technical staffs, operating a plant comprising acres of brass, iron and steel foundries, five huge machine shops and other extensive fabricating facilities, have made Newport News one of the world's largest producers of hydraulic turbines, valves, gates, penstocks and other essential equipment... both standard and special in design.

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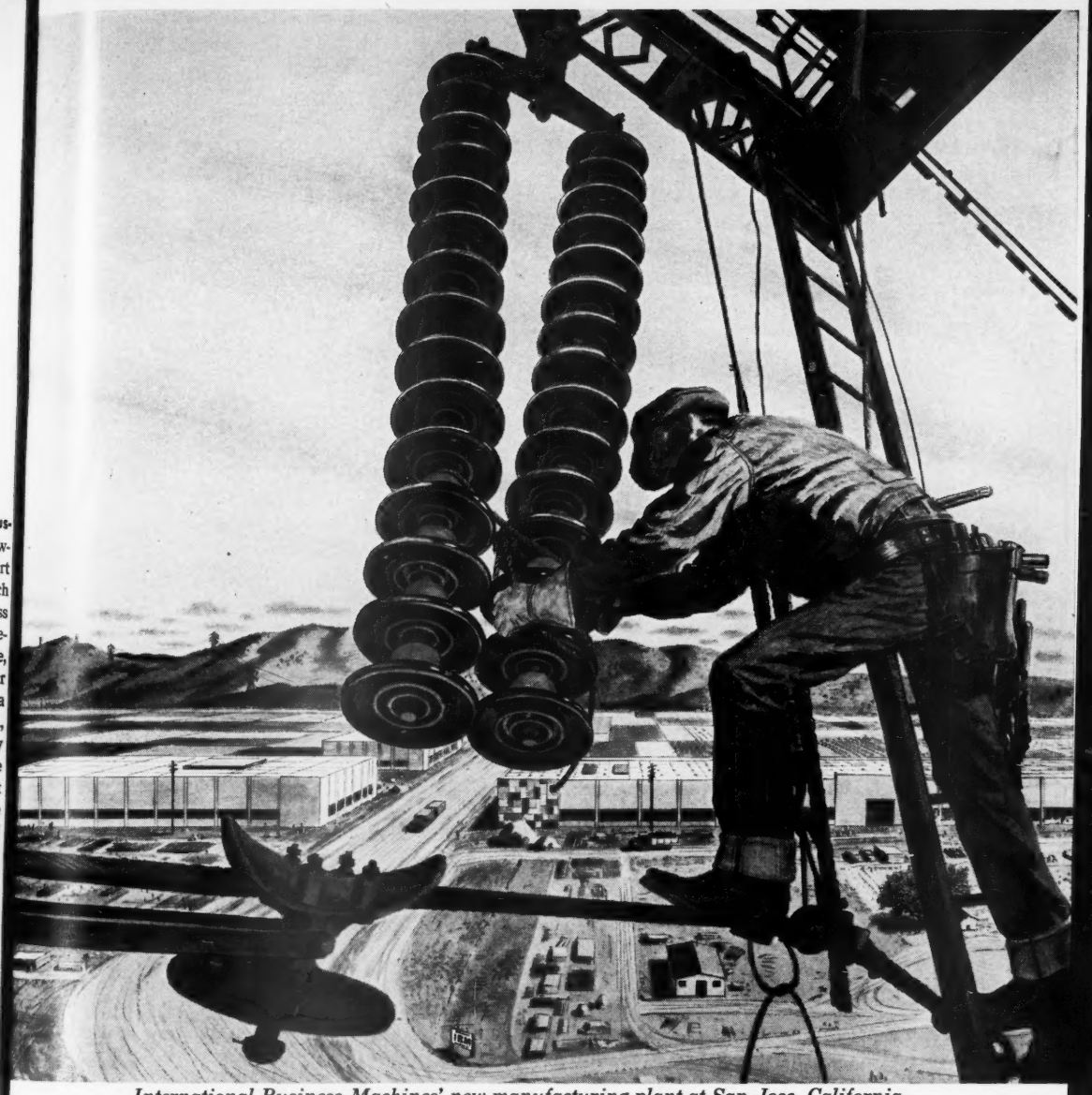
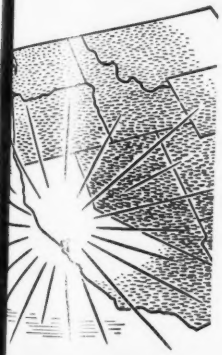


International Business Machines' new manufacturing plant at San Jose, California.



orthern and Central Cali-
rnia—marketing center
the Golden West.

IBM: One of P G & E's 128,000 new customers last year

Actually, IBM is one of more than a million new customers in the last ten years. That's the astounding growth of Pacific Gas and Electric Company (and Northern California).

To serve these new customers, P. G. and E. has *tripled* its capacity, investing $1.6 billion in the greatest expansion in the history of the industry. There's plenty of low-cost electricity and gas here for everyone.

California's population is increasing so fast that the experts say this will be the nation's biggest state by 1965! During 1957 we estimate our investment for new facilities will be $175 to 190 million to keep ahead of our area's growth.

PG and E

Pacific Gas and Electric Company

Some of the famous firms investing nearly $2 billion in Northern California plants since 1945

- Dupont
- Goodyear
- General Electric
- Westinghouse
- Ford
- U. S. Steel
- Johns-Mansville
- Monsanto Chemical
- Owens-Illinois Glass
- Sylvania

New compressor stations, like the one pictured above, are constantly being built to m
the steadily increasing demands for natural gas. These compressor stations pump natural g
through Columbia's 36,716 miles of pipeline to homes and industries in America's Heartla

Columbia's Thinking Is *Constructive*

Customers in the area served by the Columbia Gas System keep calling for more and more natural gas —to meet a constantly increasing need for energy. To supply it, facilities with greater capacity must be constructed—new or enlarged compressing stations, pipe lines, metering stations and other equipment. So Columbia must think constructively!

During the past decade, the Columbia Gas System has spent more than a half billion dollars for construction. This year alone, Columbia expects to spend about $87 million on new facilities—to meet immediate and future natural gas requirements of more than three million families, businesses and industries in the dynamic and growing Heartland of American commerce and industry.

Where System companies serve within this seven-state Heartland—Pennsylvania, Ohio, West Virginia, Virginia, Kentucky, Maryland and southern New York—Columbia's residential sales have doubled, its househeating customers have increased almost three-fold in just ten years.

Growth in the Heartland shows no signs of diminishing . . . so to keep pace with the Heartland's growth, to provide the facilities and the service a growing number of customers require, Columbia thinks and plans constructively for the future.

serving homes and industry in America's Heartland

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COLUMBIA GAS SYSTEM SERVICE CORPORATION

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COLUMBUS GROUP: The Ohio Fuel Gas Company . . . **PITTSBURGH GROUP:** The Manufacturers Light and Heat Company, Columbia Gas of New York, Inc., Cumberland and Allegheny Gas Company, Home Gas Company

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Prometheus, one of the earliest characters in classical mythology, gave the gift of fire to mortals and was punished for this infringement on the gods. He was bound to a rock to be devoured by an eagle and by the elements. But Prometheus persevered over all. His name still symbolizes enormous endurance over incredible hardship.

ENDURANCE BREEDS CONFIDENCE

Symbols that clearly show unusual endurance over the elements are uncommon. The mythological Prometheus represents strong day-after-day endurance. There's another such symbol, too . . . but not fictional. Kerite Cable, year in, year out, successfully resists the damaging effects of time and the elements. Whether exposed to the humid heat of the tropics, or the rigors of the cold damp Arctic, Kerite, wherever it is used, can be relied on for outstanding performance. That's why there is little cause for surprise when Kerite Cable laid in unusually difficult installations 40 or more years ago is found still to be in perfect operating condition today. Kerite's acceptance is greatest with those who have used it longest. Endurance, over the years, breeds confidence.

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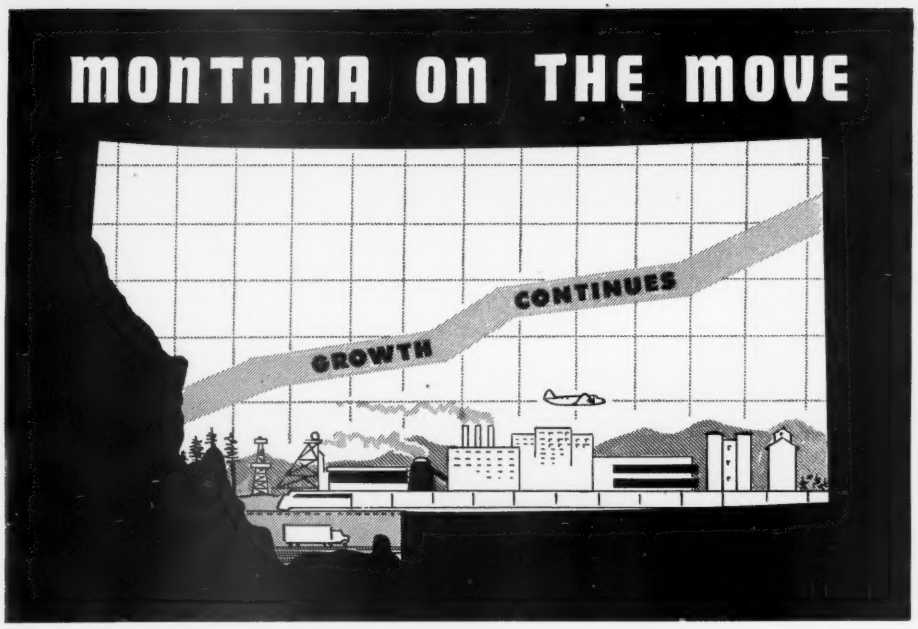


Another Post-War Decade Is Off to a Good Start

Montana's first decade after World War II showed a rising, stable economy that carried on through 1956, the first year of the second post-war period.

The trend in 1957 is upward as more and more people find that Montana's abundant resources and healthful climate are for them. It's fun being a Montanan.

Population Up

Since 1950, the State's population has increased 14 per cent, to 675,000. A Census Bureau official recently predicted that the Rocky Mountain region would experience the second largest population gain, proportionately, of any area in the five years ending in 1960.

Incomes High

Personal income of Montanans topped a billion dollars for the sixth year in a row in 1956. Per capita income in the state is high.

New Industries

New industries already are in the state and others are heading this way to develop the State's abundant resources with the vast quantities of low-cost power and fuel available.

Output Increases

Production is rising in three important fields: oil, where a new record output of 21,700,000 barrels was reached; metals, particularly in the Butte area, and lumbering, utilizing Montana's forests.

We're Growing, Too

During the year, we added 3,905 electric customers, bringing our total to 141,143, and we added 6,207 natural gas customers, boosting this total to 51,465.

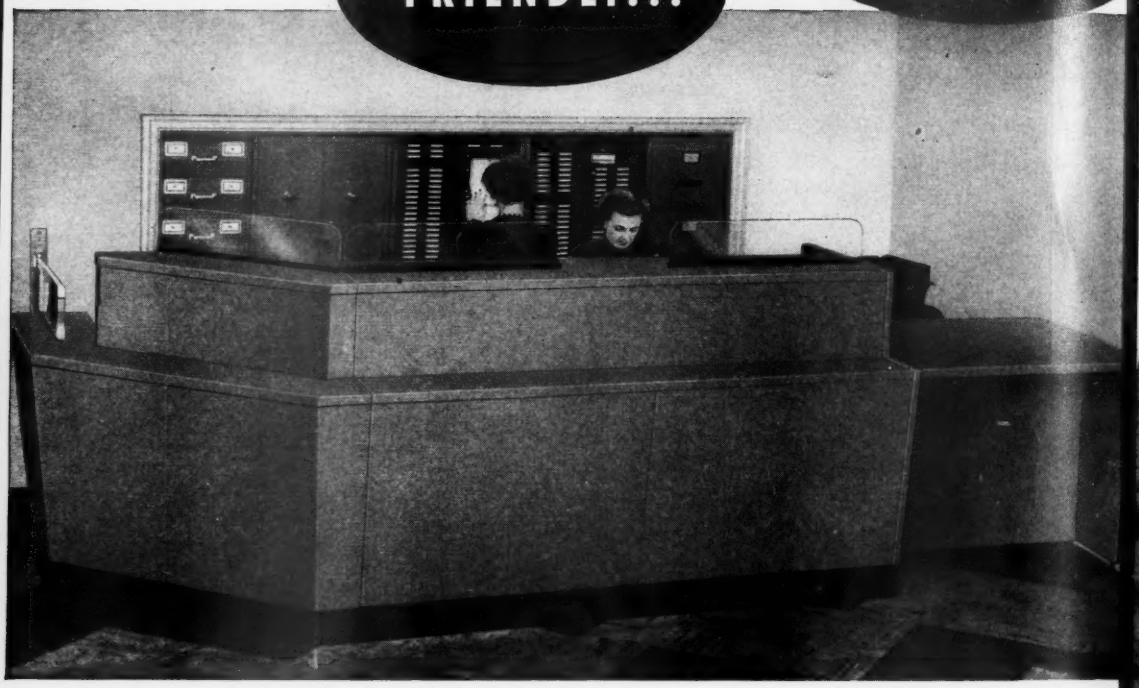
Work is more than one-fourth complete on our 13th hydroelectric plant, Cochrane Development, which will increase system capability to 671,000 KW when the job is finished late this year.

MONTANA IS A POWER-SURPLUS STATE

The Montana Power Company

Serving a GROWING State

FLEXIBLE... FUNCTIONAL... FRIENDLY... FIRE-RESISTAN



These words best describe the REMINGTON RAND® Sectional Customer Service Counter... designed for combination Public Utility cashiering-bookkeeping. It offers custom-made beauty and efficiency without custom-made limitations, and at a mass-production price.

Rapid, face-to-face service to customers... ideal counter height, and a continuous parcel shelf for resting packages or bundles is provided. Working area side is compact without being crowded; Customer Service and History Records are within arm's reach to rear in insulated Safe KARDEX® cabinets. Visible control of these important records speeds reference and posting... enables faster service to customers... and saves you time and money.

Certified, insulated pedestal units provide 24-hour "Point-of-Use" protection for vital records against loss by fire... uninsulated pedestal units are available for records which can readily be duplicated. Two or more counters may be joined together for larger offices.

Get all the facts by reading booklet SC764 (New Sectional Customer Service Counter)... yours FREE upon request. Write to Remington Rand, Room 1657, 315 Fourth Ave., New York 10.

Remington Rand

DIVISION OF SPERRY RAND CORPORATION

Your Westinghouse representative can prove . . .

NEW TD INDICATOR SIMPLIFIES TRANSFORMER LOAD MANAGEMENT

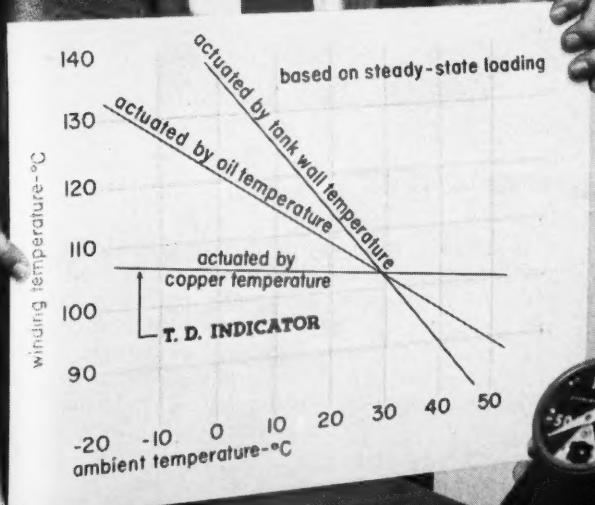
The new thermal duty indicator records total overload hours cumulatively —simplifies overload monitoring. Because it is actuated by copper temperature, you can use the full capacity of transformers. Here is a new tool for effective load management of pole-type transformers.

J-70793

YOU CAN BE SURE...IF IT'S

Westinghouse

Kent Walker, manager of Distribution, South Carolina Electric and Gas Company, and Ken Leland, Westinghouse Representative.



it can't be measured or seen . .

but it can be proved . . .

that sustained accuracy in Sprague Gas Meters over extended periods of service with a minimum of maintenance is the rule. Such proven performance can be consistently achieved only when quality materials and fine workmanship are combined with simplified design to produce a product outstanding in its field.

THE Sprague METER COMPANY
BRIDGEPORT 4, CONNECTICUT

WESTERN BRANCH FACTORY — LOS ANGELES 23, CALIF. REGIONAL OFFICES — DAVENPORT, IOWA HOUSTON 3, TEXAS SAN FRANCISCO 11, CA

Gas Meters of Simplified Design and Sustained Accuracy

this brand on each pole is your assurance of pole pedigree . . . and guarantee of—

pole protection

Long-Bell pressure-treated poles with creosote or pentachlorophenol

When you specify a pole that carries the Long-Bell brand, you have the result of 78 years lumber experience, over half a century of wood preserving know-how. From vast tracts of timber land in the South and West, carefully selected trees are cut, expertly prepared and deep pressure treated with proven preservatives. Your order is assured of prompt, efficient handling from ample stock at one of five of our conveniently located treating plants.

Poles • Posts • Piling • Cross Arms • Ties • Lumber

INTERNATIONAL PAPER COMPANY
Long-Bell
DIVISION

Wood Preserving Sales
Kansas City, Missouri • Longview, Washington

Treating Plants: DeRidder, La. Navasota, Texas Joplin, Mo. Weed, Calif. Longview, Wash.

Whether in general operations, financing, engine
ing or other business matters, the consulting a
advisory services of Commonwealth can be of ma
rial assistance.

These services are integrated with the pla
and policies of client management in accompli
ing the desired objectives. Commonwealth expe
ence is built on work covering many states a
companies, in operations varying from a few e
ployees to thousands, and in projects from a f
dollars to many millions.

Commonwealth is an independent organizati
built on a business record of 50 years, and who
owned by officers and employees.

Let our booklet tell you more.

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COMMONWEALTH ASSOCIATES INC.

The Commonwealth Professional Engineering Organization

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BUSINESS DEVELOPMENT
INDUSTRIAL RELATIONS
PUBLIC RELATIONS
STOCK TRANSFER
PROXY SOLICITATIONS
GENERAL CONSULTATION
ENGINEERING—
CONSULTING AND DESIGN

TAXES
DEPRECIATI
ACCOUNTIN

sign of outstanding banking service

why don't you talk to the people at Chase Manhattan—they're ready to provide a complete range of banking services.

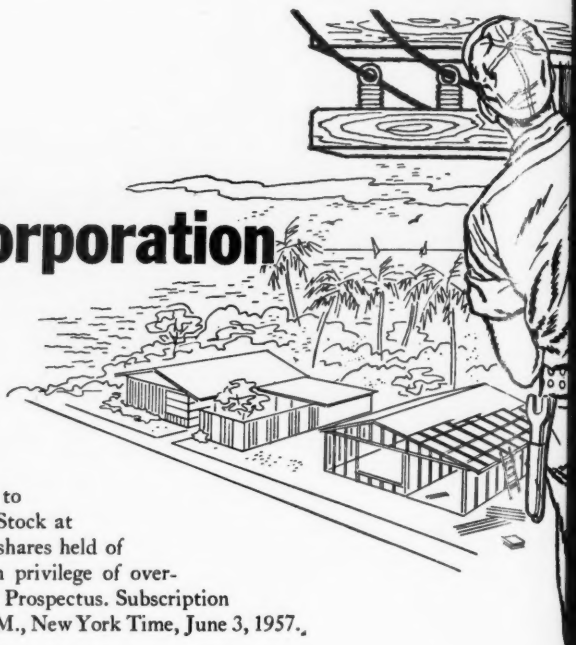
93 CONVENIENT OFFICES IN GREATER NEW YORK

THE
CHASE MANHATTAN BANK

Member Federal Deposit Insurance Corporation

This is not an offer of these Securities for sale. The offer is made only by the Prospectus.

NEW ISSUE



255,813 Shares

Florida Power Corporation

Common Stock

(Par Value $7.50 Per Share)

Florida Power Corporation (the "Company") is offering to the holders of its Common Stock the right to subscribe for 255,813 additional shares of Common Stock at $51 per share at the rate of one share for each ten shares held of record at the close of business May 14, 1957, with privilege of over-subscription, subject to allotment, as set forth in the Prospectus. Subscription Warrants evidencing such rights will expire at 3:30 P.M., New York Time, June 3, 1957.

Subscription Price $51 per Share

The several underwriters have agreed, subject to certain conditions, to purchase any unsubscribed shares and, during and after the subscription period, may offer shares of Common Stock as set forth in the Prospectus.

Copies of the Prospectus may be obtained in any State in which this announcement is circulated from only such of the underwriters, including the undersigned, as may lawfully offer these securities in such State.

Kidder, Peabody & Co. — **Merrill Lynch, Pierce, Fenner & Beane**

Bear, Stearns & Co. — **Goldman, Sachs & Co.** — **Hornblower & Weeks**

W. C. Langley & Co. — **Paine, Webber, Jackson & Curtis**

Wertheim & Co. — **White, Weld & Co.**

May 15, 1957.

Send for your copy

DP&L SERVES OVER A MILLION PEOPLE IN WEST-CENTRAL OHIO

The financial highlights in the adjoining column tell the story of another "good" year. In our annual report we have tried to tell the story of the people that made this progress possible. We will be happy to send you a copy.

FINANCIAL HIGHLIGHTS

	At December 31 1956	1955
Property and plant	$224,218,000	$201,738,000
Capitalization	$173,142,000	$170,688,000
Capitalization ratios—		
Common stock equity	38.3%	37.4%
Preferred stock	14.4%	14.6%
First mortgage bonds	47.3%	48.0%
	100.0%	100.0%
Number of shares—common stock	2,629,037	2,619,256
	For the Year	
Operating revenues	$ 73,527,000	$ 68,023,000
Earnings on common stock	$ 10,010,000	$ 8,798,000
PER SHARE OF COMMON STOCK		
Total taxes	$5.92	$5.49
Earnings	$3.81	$3.36
Dividends paid	$2.25	$2.05

THE DAYTON POWER AND LIGHT COMPANY

25 North Main Street • Dayton 1, Ohio

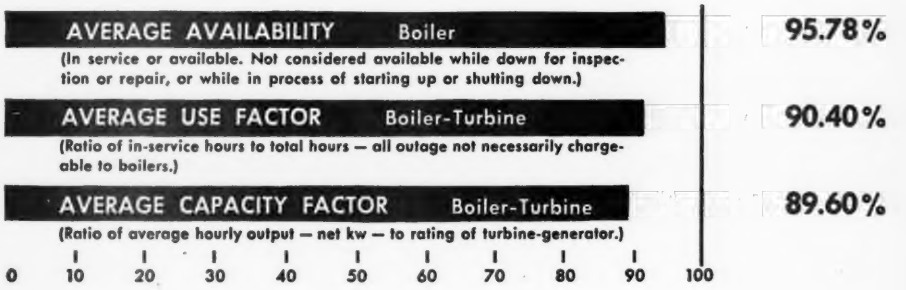
the No. 1 factor

eneration costs

OPERATING RECORD OF 103 C-E REHEAT BOILERS

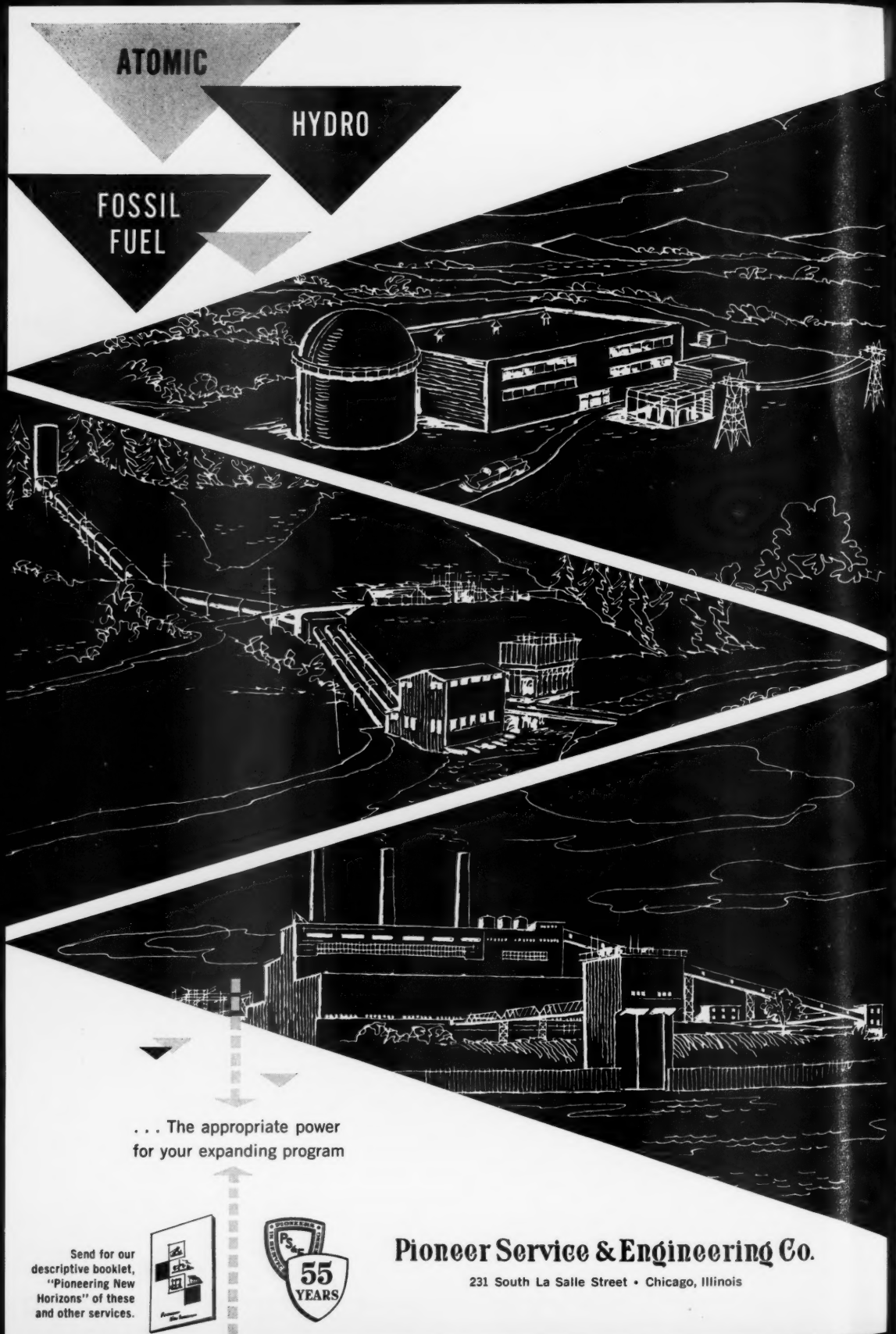
The first of these boilers was placed in service in 1949. By the end of 1956, one hundred and three units were "on the line." Significant data concerning these boilers which, in this report, are all private utility units, are summarized below.

Number of Units	103
Total Capacity — Mw	11,265
Average Capacity per Unit — Mw	109
Total Boiler Time — Hours	2,635,524
— Years	307



PER CENT TOTAL HOURS OF OUTAGE

Inspection	2.72%
Boiler — Superheater — Reheater — Economizer — Desuperheater — Air Heater — Fuel Burning Equipment	0.95%
Auxiliary Equipment — Valves — Fans — Soot Blower — Miscellaneous	0.55%
TOTAL	4.22%



. . . The appropriate power
for your expanding program

Send for our descriptive booklet, "Pioneering New Horizons" of these and other services.

55 YEARS

Pioneer Service & Engineering Co.

231 South La Salle Street • Chicago, Illinois

Florida has...

PROVED PULLING POWER FOR MANPOWER!

America's industries, moving to Florida in an increasing tide, find that recruitment problems fade in Florida sunshine. Skilled workers in every category—the "cream" of America's labor crop—have their eyes on Florida! They're *moving* to Florida, too... filling jobs as fast as they open up under the state's continuing record growth. The reasons are obvious: year-round accent on outdoor family living... golden sunshine, absence of temperature extremes... boundless opportunities for happier, healthier, more productive living and working!

The Hon. LeRoy Collins, Governor of Florida, says:

"You'll like Florida's golden business climate"

Florida's government is friendly to business. Investment capital is welcome and it flourishes. No state income, duplicating inheritance or ad valorem taxes! Check these advantages and many more!

AMPLE POWER FOR FLORIDA'S FORWARD SURGE!

Florida Power & Light Company is keeping ahead of Florida's record industrial growth! Generating capability has been expanded 52% in the past 3 years, and will be expanded an additional 64% in the next 3 years!

Write us your needs and we'll gladly help. Address: Industrial Development Service, Florida Power & Light Company, P.O. Box 3100, Miami 30, Florida

HELPING BUILD FLORIDA

FLORIDA POWER & LIGHT COMPANY

Miami, Florida

In actual road tests . . .

Dodge won top honors in test after test between comparable models of all three low-priced trucks. Special high-speed camera records actual finish of hill-climb test. From a standing start, test crews raced all three trucks up a 32% grade. Dodge was *first* by five lengths.

and on your job . . .

Dodge gives you more V-8 power, in every weight class, than either of the other two low-priced trucks. From 204-hp. pick-ups to 232-hp. tandems, the extra power you get in a Dodge means an on-the-job performance bonus for you. It means greater economy, too, because it cuts down engine strain, reduces wear and repairs.

Dodge *Power Giants* outpower, outperform the "other two" low-priced trucks by wide margin

Want power? Dodge outpowers its low-priced competitors by as much as 27 percent.

Want economical performance? The advanced design of the Dodge short-stroke V-8 produces the most efficient fuel usage in the industry. You get more miles per gallon . . . full power on *regular gas*.

Want extra payload capacity and handling ease? Dodge has 'em beat on both counts.

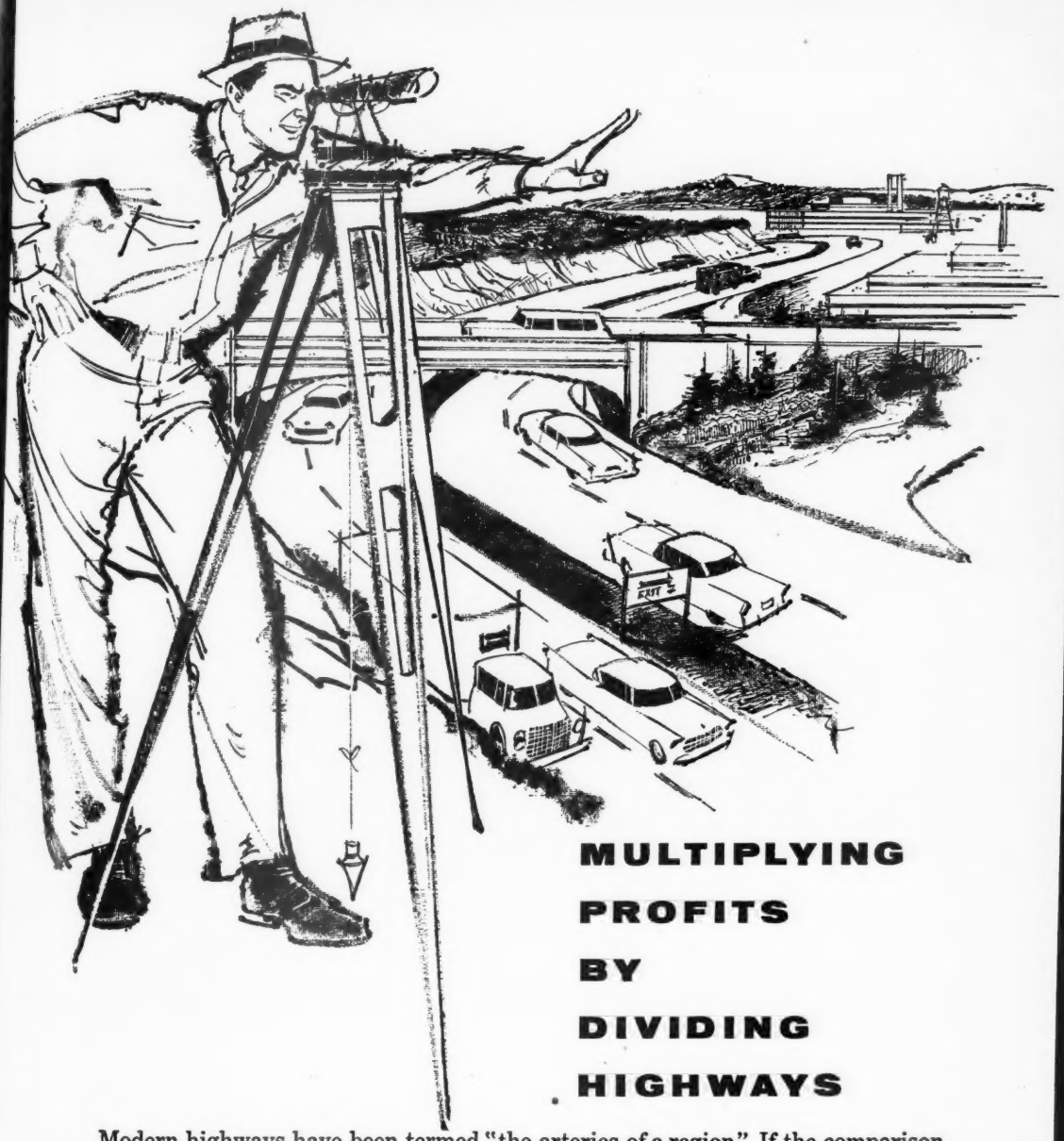
How about it? Don't you think you should find out for yourself? Just give your Dodge dealer a ring. He'll bring a truck right to your door and he'll show you certified test results that demonstrate Dodge is a winner in actual tests and on your job.

DODGE

PowerGiants

MOST POWER OF THE LOW-PRICED 3

Why all the activity in New England Electric?



MULTIPLYING PROFITS BY DIVIDING HIGHWAYS

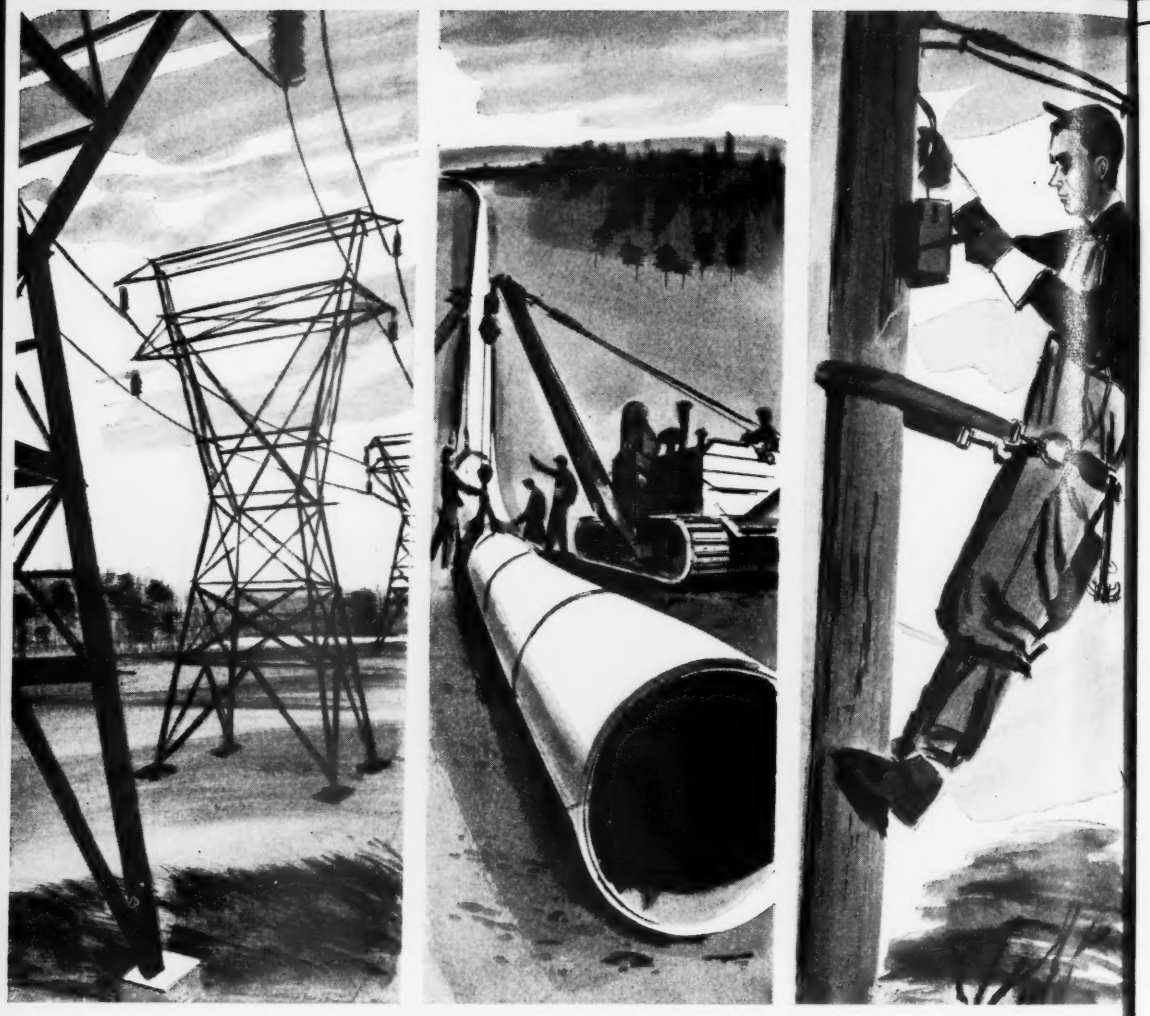
Modern highways have been termed "the arteries of a region". If the comparison is good then New England's circulation is rapidly improving, thanks to a progressive highway building program.

Super-highways, criss-crossing the area, carry nourishing commerce to all points of the compass, plus new ease in travel to recreation spots that makes people want to live and work in New England. All of this is ushering in new profits and prosperity to the region where New England Electric supplies power to more than two and one half million people.

All this means good living and profit to New Englanders —and profit, too, for farsighted folks in other sections of the country who have investments in New England industry and business.

NEW ENGLAND ELECTRIC SYSTEM
New England's Largest

NEW ENGLAND ELECTRIC SYSTEM



THE IRVING TRUST COMPANY SERVES VITAL INDUSTRY

service lines into the future...

Vast growth of the Utility Industry has had its share of financial complexities. However, close to the pulse of the financial world and to the Industry itself, our specialists continue to reach ahead with new and sound approaches.

Whether an undertaking of capital planning, financing, or cultivation of the financial community—our Analytical Studies, Seminars and Round Tables may prove valuable aids to your company's future.

For more information, call Public Utilities Department at DIgby 4-3500 or write us at One Wall Street.

IRVING TRUST COMPANY

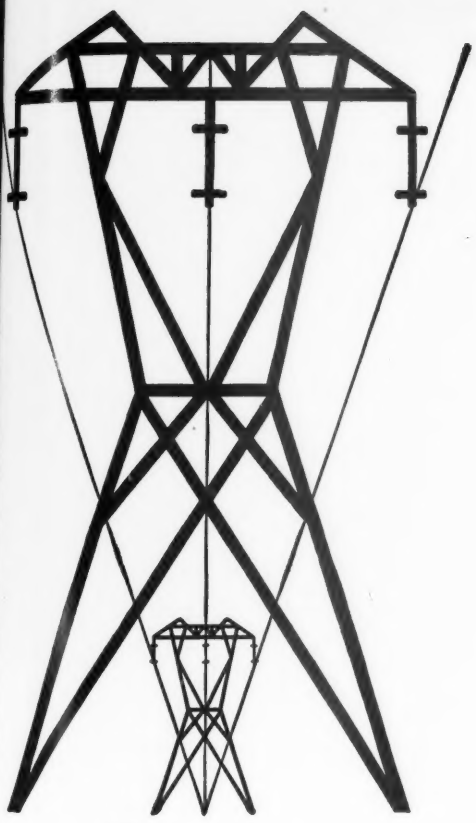
One Wall Street, New York 15, N.Y.

Capital Funds over $125,000,000 *Total Assets over $1,500,000,000*

RICHARD H. WEST, *Chairman of the Board* GEORGE A. MURPHY, *President*

Public Utilities Department—JOHN F. CHILDS, *Vice President in Charge*

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION



- **Complete Banking Service**
- **A Public Utility Department**
- **145 Years' Experience**

THE FIRST NATIONAL CITY BANK OF NEW YORK, since 1812 has helped finance every important source of energy America has known—from the water wheel to great electric and gas systems and interstate pipelines.

To make this background of experience quickly available, The Bank has established a special Public Utility Department. This Department is staffed by officers who are thoroughly familiar with all phases of utility financing. It is their job to focus the Bank's full resources through one channel to provide effective assistance to the industry in financing its tremendous construction program.

For all types of commercial banking service, please call on us.

The **FIRST**

NATIONAL CITY BANK

of New York

Head Office: 55 Wall Street, New York 15, N. Y.

70 Overseas Branches, Offices and Affiliates — 75 Offices Throughout Greater New York

First in World Wide Banking

Member Federal Deposit Insurance Corporation

This is not an offer of this Common Stock for sale, nor a solicitation of an offer to buy any of this Common Stock. The offer is made only by the Prospectus.

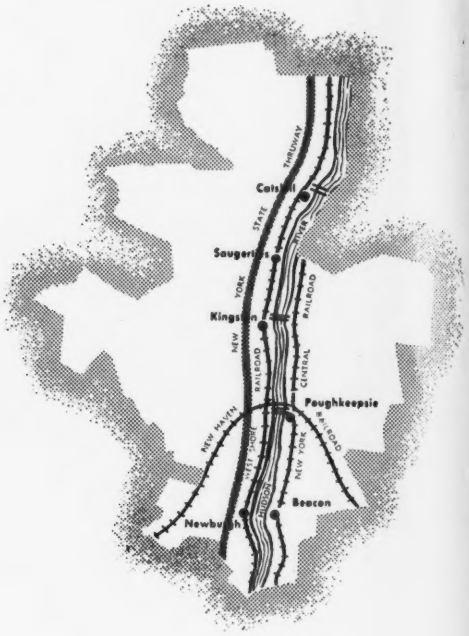
NEW ISSUE

280,000 Shares

Central Hudson Gas & Electric Corporation

Common Stock

Without Par Value



Price $15⅝ per Share

Copies of the Prospectus may be obtained in any State in which this announcement is circulated from only such of the underwriters as may lawfully offer these securities in such State.

Kidder, Peabody & Co. — **Estabrook & Co.**

Merrill Lynch, Pierce, Fenner & Beane — **A. G. Becker & Co.** Incorporated — **Hemphill, Noyes & Co.**

Hornblower & Weeks — **Paine, Webber, Jackson & Curtis** — **Hayden, Stone & Co.**

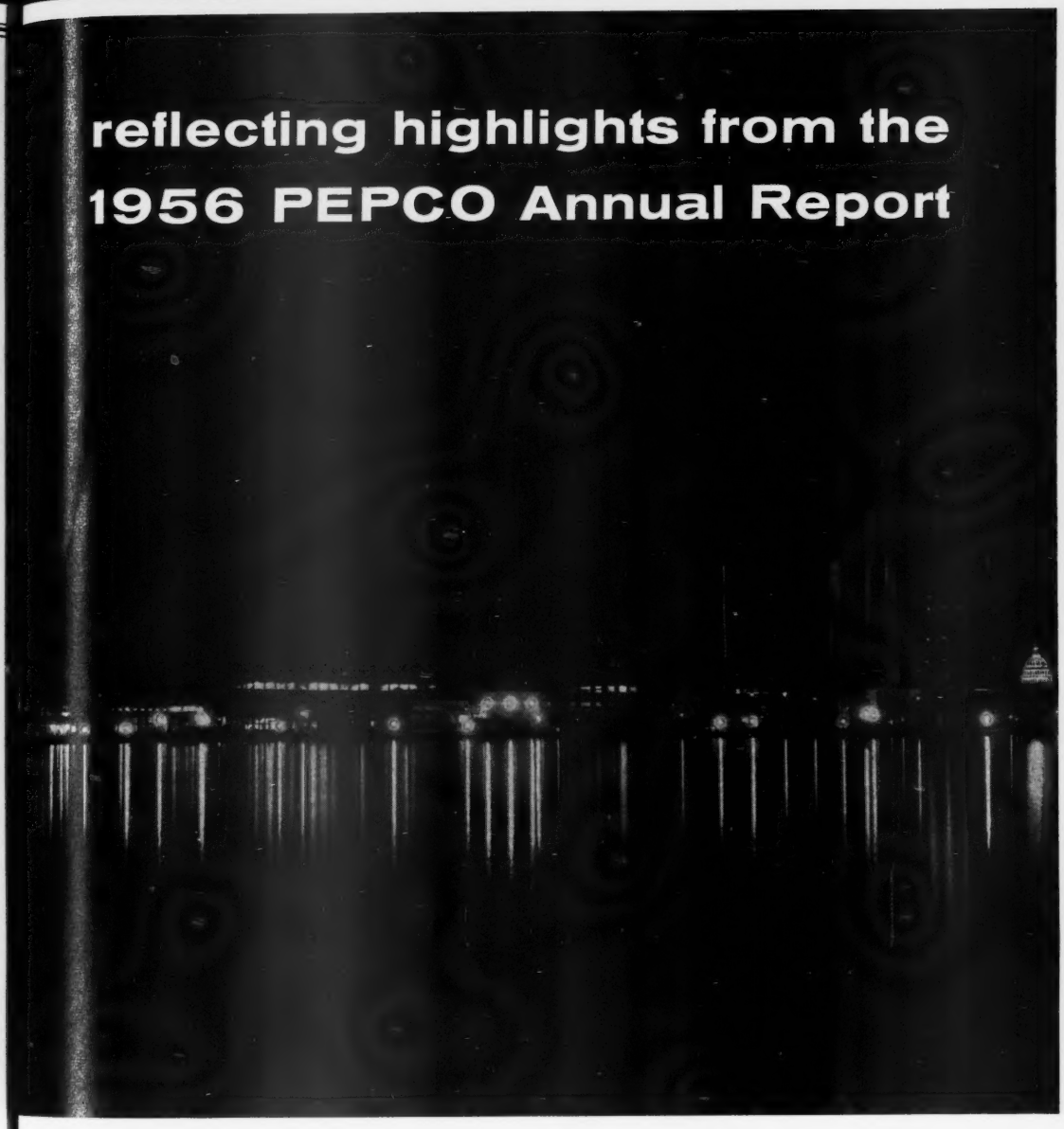
Laurence M. Marks & Co. — **Shearson, Hammill & Co.** — **Spencer Trask & Co.**

Tucker, Anthony & R. L. Day — **Stroud & Company** Incorporated — **Craigmyle, Pinney & Co.**

Mitchum, Jones & Templeton

May 15, 1957

reflecting highlights from the 1956 PEPCO Annual Report



President R. Roy Dunn stated in his letter to stockholders:

Revenue was up 10%

Net Income was up 13%

Outstanding Common Shares were up 5%
(resulting from a 1 for 20 subscription rights offering)

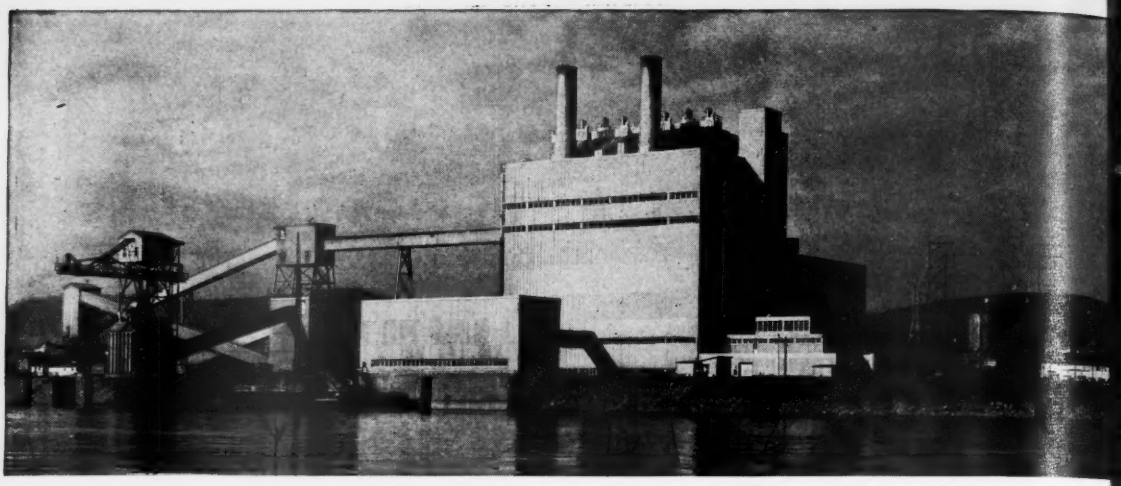
Earnings were $1.54 per Common Share, up 8%
(an increase of 11¢ per share with 5% more shares outstanding)

Dividends were $1.10 per Common Share, up 10%

Pepco
Matchless Service

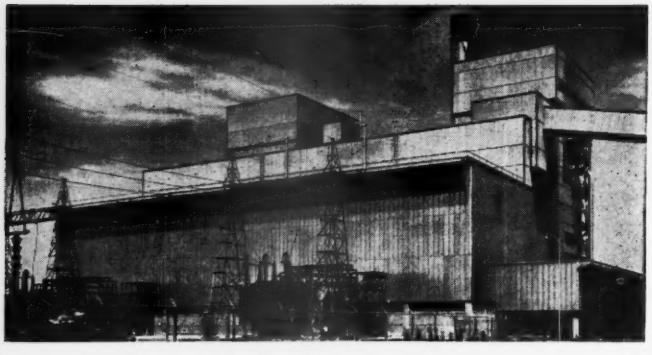
POTOMAC ELECTRIC POWER COMPANY

in the Nation's Capital

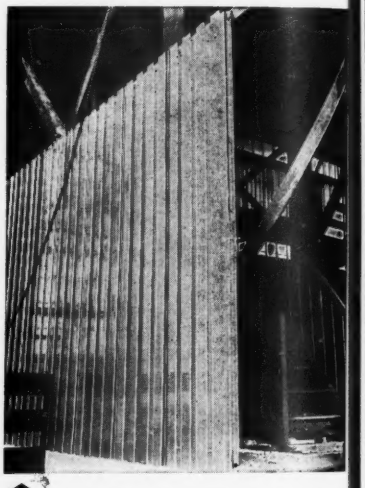


Why fine new power plants everywhere have Q-Panel Walls

Builders of new power plants in all parts of the country have specified Q-Panel walls for the following very good reasons: 1. Q-Panels are permanent, dry and noncombustible, yet may be demounted and re-erected elsewhere to keep pace with expansion programs. 2. Q-Panels are light in weight, thus reducing the cost of framing and foundations. 3. Q-Panels have high insulation value . . . superior to a 12″ masonry wall. 4. Q-Panels are quickly installed because they are hung, not piled up. An acre of wall has been hung in 3 days. For more good reasons for using Q-Panel construction, use the coupon below and write for literature.



Q-Panel walls grace the new Elrama Po Plant (above) near Pittsburgh. It was desig by Duquesne Light Company's Enginee and Construction Department. The Dr Corporation was General Contractor.



Q-Panel walls (above) go up quickly in any weather because they are dry and hung in place, not piled up.

More than 32,000 sq. ft. of Q-Panels were u to enclose the impressive Hawthorn Ste Electric Station (left) of the Kansas City, M souri, Power and Light Company. Ebasco S vices, Inc., designed and built the plant.

Robertson

Q-Panels

H. H. Robertson Company

2424 FARMERS BANK BLDG. • PITTSBURGH 22, PA.

Offices in Principal Cities

Please send a free copy of your Q-Panel Catalog.

NAME

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ADDRESS

PUFI

UTILITIES *A·l·m·a·n·a·c·k*

JUNE

Thursday—6 *National Coal Association ends 3-day convention, Washington, D. C.*	**Friday—7** *Midwest Association of Railroad and Utilities Commissioners ends 3-day annual convention, Kansas City, Mo.*	**Saturday—8** *Wisconsin Utilities Association, Accounting Section, will hold annual convention, Land o' Lakes, Wis. June 23-25.* ***Advance notice.***	**Sunday—9** *American Society of Mechanical Engineers begins semiannual meeting, San Francisco, Cal.*
Monday—10 *Michigan Electric Association will hold meeting, Mackinac Island, Mich. June 23-26.* ***Advance notice.***	**Tuesday—11** *Michigan Gas Association will hold meeting, Mackinac Island, Mich. June 24, 25.* ***Advance notice.***	**Wednesday—12** *American Water Works Association, Pennsylvania Section, begins meeting, Bedford Springs, Pa.*	**Thursday—13** *Washington-Oregon Independent Telephone associations begin joint convention, Spokane, Wash.*
Friday—14 *Public Utilities Association of the Virginias begins accident prevention conference, Charleston, W. Va.*	**Saturday—15** *Canadian Gas Association will hold meeting, Jasper, Alberta, Canada. June 24-27.* ***Advance notice..***	**Sunday—16** *American Society for Testing Materials begins annual meeting, Atlantic City, N. J.*	**Monday—17** *American Society for Engineering Education begins annual meeting, Ithaca, N. Y.*
Tuesday—18 *American Society of Heating and Air Conditioning Engineers will hold semiannual meeting, Murray Bay, Quebec, Canada. June 24-26.* ***Advance notice.***	**Wednesday—19** *Canadian Electrical Association begins annual convention, Murray Bay, Quebec, Canada.*	**Thursday—20** *Northwest Electric Light and Power Association begins annual accounting and business practice section conference, Sun Valley, Ida.*	**Friday—21** *Western Association of Broadcasters ends 3-day annual meeting, Jasper, Alberta, Canada.*

Courtesy, San Diego Gas & Electric Company

Night Lighting

High-intensity street lighting designed to promote traffic safety.

Public Utilities
FORTNIGHTLY

VOL. 59, NO. 12 JUNE 6, 1957

The American Way to a Power-Full Future

The title of this article, especially prepared for PUBLIC UTILITIES FORTNIGHTLY, *also happens to be the theme of the 1957 national convention of the Edison Electric Institute, meeting in Chicago, June 3rd to 5th. While the author takes pride in the achievements of the investor-owned electric utility industry over the quarter-century of the association's existence, he sees a continued threat to the industry's future.*

BY DONALD S. KENNEDY*
PRESIDENT, EDISON ELECTRIC INSTITUTE

As members of the Edison Electric Institute meet this month in Chicago for its twenty-fifth annual convention, a brief review of some of the high lights of the progress over this period makes all of us associated with the investor-owned electric utility industry proud of its achievements during these years.

The past twenty-five years have been marked by tremendous growth of the electric industry and the increasing dependence of all segments of our economy—industrial, commercial, residential, and rural—on the services which electricity provides. During this period, generating capacity has increased more than three and one-half times. Electric generation is about seven times what it was twenty-five years ago, an ever-widening range of new

*Also president of Oklahoma Gas & Electric Company. For additional personal note, see "Pages with the Editors."

applications having skyrocketed demand for electricity. Kilowatt-hour production for each man, woman, and child in the nation has increased almost fivefold during the past quarter-century. Through prudent foresight and planning, the industry has been able to anticipate demand, and expand generating facilities in advance to meet electric power needs at all times. Even the staggering demands of wartime production were met on time, prompting General Dwight D. Eisenhower, when Chief of Staff of the War Department, to commend the industry with his remark that, "Emergency demands, great in volume and complexity, were met fully and promptly by the American utility industry . . . We were fortunate indeed to have such magnificent support."

All of this expansion required the expenditure of vast sums of money on construction. By the end of this year, the investor-owned electric companies will have spent for this purpose approximately $32,250,000,000 over the past twenty-five years. Only a fraction of this money could come from within the companies themselves, with the remainder coming from investors. We are exceedingly proud of the confidence displayed in our industry by investors, as demonstrated by their splendid response to our requests for needed funds.

In 1932, the industry was serving less than 24 million customers, while today we have over twice that many—an estimated 54 million customers. Average use per residential customer in that year (1932) was 601 kilowatt-hours; early this year the average use per domestic customer passed the 3,000 kilowatt-hour mark. The growth in the scope and number of electric appliances for the home over the past twenty-five years has been truly amazing. Many "electrical helpers" have been developed to aid the homemaker in getting household jobs done faster and easier, and then still other electric appliances are available to help her enjoy the additional hours of leisure which the "electrical helpers" made possible. One major manufacturer reports that approximately 60 per cent of appliance sales last year were products introduced since World War II.

Continuous research for, and application of, more efficient operating methods, together with increased use, have helped to reduce the price of electricity drastically over the years. In the case of residential consumers, the average revenue per kilowatt-hour is less than half of what it was twenty-five years ago, while the average revenue per kilowatt-hour received from other customer classifications has also been reduced substantially. The public has recognized this effort to render service at the lowest possible cost through the constant application of techniques for greater efficiency, economy, and service.

In the home, in the factory, and on the farmstead electricity has become a vital part of our daily life. Through dependable, low-cost service, we have made it possible for other businesses and industries to make fuller utilization of electricity, resulting in a steadily rising national economy and the highest standard of living in the world. In all, the electric industry has made an enormous contribution to America's growth and well-being, to its domestic, economic, and industrial life, to its defense, and to its place of leadership among the nations.

Telling the Story of Government Ownership

"IN the minds of many of the industry's leaders the greatest problem confronting the industry today is the lack of knowledge and, it must be admitted, the apparent indifference of a great part of the public to the menace of spreading government ownership of electric power. It would appear that the solution of the problem is primarily one of communication, particularly regarding the operation and effect of the preference clause and the tax-exempt status of governmental power projects. But the solution is not simple."

WE are naturally proud of this record. Just as naturally we want to add new luster to it in the years ahead. There should be ample opportunity. Among the forecasts which we hear today for the next quarter-century are an estimated growth of 32 million new families . . . 35 million new homes . . . and a gross national product of $850 billion. There is a tremendous potential for an even more brilliant record of service and accomplishment by the nation's investor-owned electric companies in the years ahead.

The greatest threat to a continuation of this record of accomplishment is not in the technical aspects of accurately forecasting future demand, nor in providing the capacity to meet this demand, nor in the ultimate problems of generation, or transmission, or distribution.

THE threat is not new. It is the stifling hand of bureaucratic administration. It is the parasitic uses of the genius of free and creative enterprise. It is the siren song of something for nothing. It is the institution that takes from Peter to relieve Paul of just payment. It is unfair competition. It is the antithesis of the theme of this year's EEI convention, "The American Way to a Power-Full Future." In short, it is Government in Business, and

more particularly, Government in the Power Business.

In 1932 government power projects had a generating capacity of about 2.4 million kilowatts; by 1956 this figure had reached 28.8 million kilowatts, with an additional 26.2 million kilowatts of new governmental capacity proposed for installation in the next ten years. Eighty per cent of the American people, the customers of the investor-owned, tax-paying electric utilities, contribute to the support of these government installations so that the remaining 20 per cent may have tax-free government power.

It has been estimated that less than 10 per cent of the population benefits directly from the federal government's $10 billion investment in power facilities already constructed or authorized. The citizens of New York, New Jersey, and Pennsylvania, representing 20 per cent of the total population and paying 29 per cent of the taxes, for instance, receive no power from the federal projects.

Of every dollar paid by the customers of the investor-owned electric companies for electric service, 23 cents goes for taxes, federal and local. Government power installations, on the other hand, pay no federal taxes and little, if any, local taxes. In addition to such tax inequalities, customers of the private electric companies are further discriminated against by the workings of preference clauses which give preference in the sale of federal power to subsidized power groups at rates below fair value and even below cost.

There have been encouraging indications recently of a growing awareness of the injustice of such provisions—both on the part of government officials and private citizens. The Hoover Commission, for instance, has taken note of the fact that federal power projects are not operated according to sound business principles, from a financial standpoint, and believes that such agencies should be regulated in the same manner as private utility companies. If federal power agencies were obliged to pay the same tax rates as private companies and to pay normal interest rates on the capital invested in them, the "cheap public power" myth would be exposed for the fraud it is. The commission also dealt the preference clause a blow by recommending that private utilities be allowed to purchase a fair share of federal power.

In the minds of many of the industry's leaders the greatest problem confronting the industry today is the lack of knowledge and, it must be admitted, the apparent indifference of a great part of the public to the menace of spreading government ownership of electric power. It would appear that the solution of the problem is primarily one of communication, particularly regarding the operation and effect of the preference clause and the tax-exempt status of governmental power projects. But the solution is not simple.

It is an undertaking which must be well-conceived and well-executed, and one in which it is hoped that the entire investor-owned part of the industry would share. In solving the technical and operating problems which arise to challenge the growth of our individual companies, let us not neglect this greater problem of our whole industry. There is strong evidence for the belief that public respect and recognition of the industry's attainments in supplying electric service are presently at

their highest, thus the public is probably more receptive to learning the facts now than at any other time in the past. I think, too, that never before have leaders in our industry been so conscious of the necessity for practical, well-considered, fruitful work in the field of communication.

MANY capable minds in our industry have been applying their best thoughts to means and methods by which this communications problem can best be solved, and the results show gratifying progress. It is not my purpose in this article to spell out a particular course of action. Rather I want to emphasize again the basic importance of this problem to the investor-owned power industry and to the nation as a whole, and to encourage the adoption of a program of action. I am certain that with teamwork on the part of the whole industry, and by taking advantage of every opportunity to recite the facts, we can win further recognition of the existence of preference and unfair taxation. By the repetition of simple, truthful, and incontrovertible statements of fact, we can drive home both public understanding and public conviction of wrongs to be righted in the interest of our customers.

I AM convinced that the solution of the problem rests in the minds, responses, and actions of the people when they know the facts. We will be approaching a solution to the problem when people all over the country have the answers to these two questions:

Where is the justification for the discrimination of the preference clause against the great majority of American citizens?

Why shouldn't power consumers in public power distribution areas contribute to the support of the federal government through taxes on electricity, to the same extent as customers of the investor-owned power companies?

Utility Progress on Atomic Power

"WE in the electric business are well on our way to solving the nuclear problems for our industry. And this is a major achievement because it was only [recently]—through the Atomic Energy Act of 1954—that the Congress gave American private industry specific latitude in the development of peacetime uses of atomic energy.

"Today more than $300 million from individual investors are involved in the planning and construction of atomic electric plants and related research. Forty-four electric companies are participating in building nine reactor plants with an aggregate capacity of over one million kilowatts.

"We are not in a race to see who gets there first. In fact, the United States is sharing some of our nuclear knowledge on non-military developments with other nations. Our need is not for kilowatts. The need is for scientific and technological progress which will make nuclear electricity economic and therefore useful."

—N. R. SUTHERLAND,
President, Pacific Gas and Electric Company

Electric Power for an Expanding Economy

Teamwork will be necessary if the investor-owned electric utilities, in co-operation with government authorities, are to fulfill the almost explosive demand indicated for the future of more and more power.

BY THE HONORABLE FRED A. SEATON*
SECRETARY OF THE INTERIOR

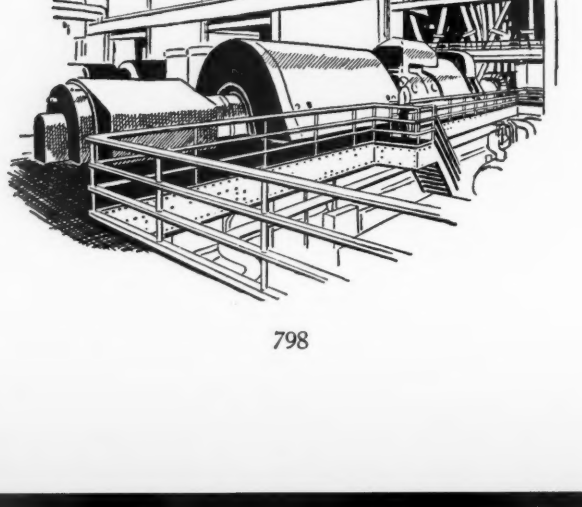
OUR population is growing at a rapid rate: There will be 221 million Americans or more by 1975. Our economy is expanding, having passed the $412 billion mark in 1956 and now moving toward $500 billion a year.

Our electric power needs are therefore also growing.

Under such circumstances there are two dangers. The first is that we shall not produce enough power to meet our country's needs in the next ten or twenty years. The second is that the federal government will gain more control over our electric power facilities than is necessary or desirable.

THESE facts and these dangers underlie the administration's power policy.

Consider the first danger first: The Federal Power Commission estimates that by 1965 we shall need 96 million more kilowatts of generating capacity than we have now. At present rates each kilowatt costs $464. Our economy will therefore have to spend—for generation, transmission, and distribution facilities—$44,544,000,000 in less than a decade. By 1975 the



* For additional personal note, see "Pages with the Editors."

comparable amount will be $96,048,000,000.

Only about 8½ per cent of the new capacity needed by 1965 can come from hydroelectric plants, the type which the federal government has traditionally built or helped to build. Fifteen per cent, at the outside, may come from atomic energy plants. The rest, 77 per cent, will have to come from steam plants, burning fossil fuels—coal, oil, natural gas. Except in the TVA region, the government traditionally has not built steam plants. And the Congress has never spent for power development at the rate which would be necessary to meet the power needs which I have just outlined.

FACED with these facts, you have two alternatives. You can urge that the government reverse its policies, enter the steam plant business on a large scale, and allot a bigger slice of the federal tax dollar than ever before to power development. Or you can uphold the principle—the teamwork principle—that the federal government should build some power facilities, the state governments some, local governments some, and private utilities some.

If you take the first alternative, you will have to wait a long while (possibly even a dangerously long time) for the Congress to start spending for power as you want it to. In the meantime—and these are crucial years—our population will continue to grow. Our power needs will expand.

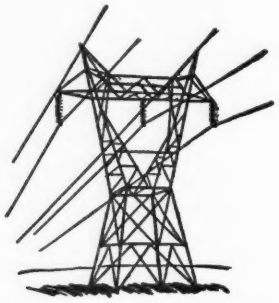
The possibility of shortages of electricity will be a constant threat.

If you take the second alternative, you can have a reasonable expectation of new projects started today and new power put on the line at approximately the same rate as that of the growth in demand.

Actually, most Americans believe in the teamwork concept. Except for the zealots, most people neither want to abolish the private utilities and the state and municipal PUD's nor to remove the federal government from the power field. We believe that each of these organizations has its proper place and its share of work to do in producing and marketing power. Only through the teamwork of all can the country be assured of adequate power development. And we believe that through teamwork the country can simultaneously avoid the second danger I mentioned at the outset: an excess of federal control. For teamwork assures us of many sources of capital and decision making—not just one—in the electric power field.

Teamwork has, in fact, been responsible for much of our progress so far.

THIS nation's standard of living has never been equaled elsewhere in the world. But our accomplishment owes much to the reliability, economy, and adequacy of our country's electric service. Scientific and technological developments have led to the manufacture of reliable and efficient generation, transmission, distribution, and utilization equipment. Twenty-five years ago one pound of coal produced .67 kilowatt-hour. Today the same pound of coal produces 1.06 kilowatt-hours. Twenty-five years ago small local utilities served limited geographical areas. Today transmission interconnections and pooled operations have improved the reliability of service and contributed to the economic loading of systems. New designs and the use of improved protective equipment have made



Importance of Teamwork

". . . most Americans believe in the teamwork concept. Except for the zealots, most people neither want to abolish the private utilities and the state and municipal PUD's nor to remove the federal government from the power field. We believe that each of these organizations has its proper place and its share of work to do in producing and marketing power. Only through the teamwork of all can the country be assured of adequate power development. And we believe that through teamwork the country can simultaneously avoid . . . an excess of federal control. For teamwork assures us of many sources of capital and decision making—not just one —in the electric power field."

distribution systems more reliable. Twenty-five years ago the average retail monthly cost of electric energy for 100 kilowatt-hours was about $4.75. In 1956 the cost was $3.88.

The relatively stable cost of electric service during the past quarter-century—during an economic depression, two wars, and a postwar period—could not have been maintained except for the initiative and resourcefulness of men in management, the ingenuity of scientists and engineers, and the competent decisions of state and federal regulatory agencies. These people have all rendered outstanding public service. Their accomplishment is reflected in the Federal Power Commission statistics for the past quarter-century, which show that installed generation capacity of the utility industry increased from 34,386,739 kilowatts in 1932 to 120,435,249 kilowatts in 1957. It is difficult to overestimate what this energy source has meant to the nation's increasing prosperity.

BUT we do not have to look to the past for all our evidence. Today in the Pacific Northwest teamwork is again helping an entire region's economic development.

Before President Eisenhower took

office, a former Secretary of the Interior said:

> The power supply outlook in the Pacific Northwest for the next several years will remain critical. Power requirements continue to exceed supply and the addition of defense industry loads with associated increases in civilian power requirements will further tax the existing generating and transmission facilities. Even with strict adherence to present recommended schedules for installation of new generating plants it is expected that the Pacific Northwest will be in a power shortage situation until 1957.

A power shortage was indeed imminent in this area during the latter part of 1952 and early 1953. Electric power use was curtailed. I am sure the people directly affected—especially in industries which were required to slow production and cut their payrolls—will remember the incident. This power shortage and other threatened "brownouts" occurred even though the contribution of the federal government was substantial.

Under the former administration's policy of pre-empting power sites for exclusive federal development, state and municipal organizations and private companies could only plead each year for more and more federal spending. Local initiative was stifled. Each year more serious power shortages were predicted. Business began to look elsewhere.

BUT today under the policy of "planned teamwork" much progress has been made to correct this state of affairs. Water resource development is proceeding at an ever-increasing rate. Local organizations are getting the opportunity to plan, finance, construct, and operate their projects.

The municipal plants of Tacoma, Seattle, and Eugene have facilities under construction to provide 604,000 kilowatts of energy. In Washington the Grant County, Chelan County, Douglas County, and Klickitat PUD's have currently under construction and in planning 3,456,000 kilowatts—more than the total federal kilowatt contribution in the past ten years.

These organizations, it might be observed, are not "private interests." They are public power entities. Moreover, their projects are under strict regulation by the Federal Power Commission, which, under the law, is responsible for making certain that no hydroelectric project on a river subject to federal jurisdiction will impair the fullest possible development of the resources of the entire basin.

But teamwork does not involve just local or regional or private groups. The federal government has much to do.

FEDERAL action has, for example, brought immense industrial and agricultural and human benefits to the areas of the Central valley of California, the Tennessee valley, the Missouri valley, and the Columbia river basin. The administration is well aware of the importance and necessity of wise federal programs in the water resources field. Last year, for example, the President supported and signed into law the great Upper Colorado river storage project—the largest irrigation measure ever authorized by the Congress in a single piece of legislation. Under this project tremendous reservoirs will be built. The water supply of the Upper Colorado basin—a supply used in Wyoming,

Utah, Colorado, Arizona, New Mexico, and other states—will be stabilized. Within twenty-five years irrigation water will be brought to more than 360,000 acres of land. A million kilowatts of hydroelectric power will be made available.

These changes will mean that a vast underdeveloped area, rich in natural resources, will be able to take care of the needs of an increased population for more homes, more schools, more businesses, and more productive farms.

The Fryingpan-Arkansas project is another means to the same end. Such administration measures help illustrate what the President meant when he said at McNary dam in 1954:

> The issue is not . . . public power *versus* unregulated private power. The issue posed to us is federal monopoly of power as against public or regulated power, freely chosen in each instance by the citizens of each area, with the federal government coming in as a cooperating partner where this seems necessary or desirable.

LIKE the Upper Colorado project and the TVA, McNary dam itself is an example of the type of undertaking that, because of its sheer size, can be accomplished only by the federal government. The Hoover dam is another. Grand Coulee is another. The administration looks with favor on such projects which, in Lincoln's words, need to be undertaken but which cannot be successfully undertaken by individuals or nonfederal organizations.

In accordance with this policy, in fiscal year 1956 the Bureau of Reclamation added $160 million to its $2.6 billion investment in western projects for power and other purposes. It added hydroelectric generating capacity in multipurpose dams in the amount of 120,000 kilowatts. With the Corps of Engineers, the bureau now has under way 299 projects, for flood control, navigation, irrigation, water supply, and power. The bureau, the Corps, and other divisions of government will continue to do their full and proper share as members of the team.

As the figure just mentioned indicates, of course, the development of hydroelectric power is only one of the results of the best kind of river basin project. The administration believes in multiple-purpose undertakings—projects which bring forth not just one benefit, but a variety, in irrigation development, power generation, fish and wild-life conservation, improvement of navigation. Theodore Roosevelt in 1908 forcefully set down this general principle:

> . . . every waterway should be made to serve the people as largely and in as many different ways as possible. It is poor business to develop a river for navigation in such a way as to prevent its use for power, when by a little foresight it could be made to serve both purposes. We cannot afford needlessly to sacrifice power to irrigation, or irrigation to domestic water supply, when by taking thought we may have all three. Every stream should be used to the utmost. No stream can be so used unless such use is planned for in advance. When such plans are made we shall find that, instead of interfering, one use can often be made to assist another. Each river system, from its headwaters in the forest to its mouth

on the coast, is a single unit and should be treated as such. Navigation of the lower reaches of a stream cannot be fully developed without the control of floods and low waters by storage and drainage. Navigable channels are directly concerned with the protection of source waters and with soil erosion, which takes the materials for bars and shoals from the richest portions of our farms. The uses of a stream for domestic and municipal water supply, for power, and in many cases for irrigation, must also be taken into full account.

THE Eisenhower administration believes in basin development for multiple purposes through teamwork. As the President said only a few months ago, in his State of the Union Message:

> The whole matter of making the best use of each drop of water from the moment it reaches the soil until it reaches the ocean for such purposes as irrigation, flood control, power production, and domestic and industrial uses, clearly demands the closest kind of cooperation and partnership between municipalities, states, and the federal government.

Following such a principle we can make certain that the federal government will not take on functions which properly belong to states and localities. And we can make certain also that in the years immediately before us our country will have the electricity it needs for its people, every day becoming more numerous, and their economy, every year moving to higher and higher plateaus.

EEI 1957 CONVENTION TIMETABLE, CHICAGO, ILLINOIS

Sunday, June 2nd

1:00 P.M. Registration, foyer, Grand Ballroom, Palmer House (to 6 P.M.).

Monday, June 3rd

8:30 A.M. Registration, foyer, Grand Ballroom, Palmer House (to 5 P.M.).

2:30 P.M. First General Session, Grand Ballroom, Palmer House.

5:00 P.M. President's reception, Exhibition Hall, Palmer House (to 7 P.M.).

Tuesday, June 4th

8:30 A.M. Registration, foyer, Grand Ballroom, Palmer House (to 5 P.M.).

9:30 A.M. Second General Session, Grand Ballroom, Palmer House.

12:30 P.M. Ladies' luncheon, followed by fashion show presented by Marshall Field & Co. and entertainment, Polynesian Village, Edgewater Beach Hotel.

2:30 P.M. Third General Session, Grand Ballroom, Palmer House.

Wednesday, June 5th

8:30 A.M. Registration, foyer, Grand Ballroom, Palmer House (to 3 P.M.).

9.30 A.M. Fourth General Session, Grand Ballroom, Palmer House.

2:30 P.M. Fifth General Session, Grand Ballroom, Palmer House.

8:30 P.M. Presentation of the Charles A. Coffin Award, and special entertainment arranged through the courtesy of General Electric Company, Civic Opera House.

The Investor's Rôle in Preserving American Freedom

If risk capital in sufficient quantity is not made available through normal channels of investment to provide the tools for industry, our government may, at some point, be compelled to step in and adopt a forced investment policy.

By EDWIN VENNARD*

AMERICA has progressed because its people have been free to work and save, to found businesses and industries, to question and investigate, to train and educate themselves as they wished. If we are to continue to grow and progress, we must keep these freedoms. It is the loss of such liberties as these that leads to a nation's downfall.

History has shown us that every major civilization—the Babylonian, the Egyptian, the Greek, the Roman—without exception, has suffered the same fate: supremacy for a short time, then internal decay followed by a rapid decline. For example, about two thousand years ago the Roman Empire had reached the height of its power and controlled most of the known world. As the Empire had expanded, the institutions and offices necessary to govern it had grown larger and more powerful until the government became excessively complicated, oversized, and corrupt. The citizens, once proud and free, had little by little given up their liberty by submitting to the declared need for a stronger central government. This period, when Rome outwardly appeared to be in its greatest glory, carried within it the germ of the decay which followed.

America has built the greatest civilization the world has ever known because we have thus far kept our government in its proper rôle as servant of the people, rather than allow it to become their master. But we can lose this freedom from oppression

* Vice president and managing director, Edison Electric Institute. For additional personal note, see "Pages with the Editors."

and domination; we can make the same mistakes that were made by those who preceded us.

Losing Freedom Gradually

TODAY local, state, and federal governments require $1 out of every $3 spent in the United States. In 1930, the federal budget was less than $3.5 billion; in comparison, the federal government plans to spend more than $70 billion next year. In the past thirty years the federal government has increased its responsibilities and powers enormously.

Throughout the history of mankind it has been demonstrated, time and again, that as the size and power of government increased, the freedom of the individual citizen was curtailed. Perhaps we can learn from the record of other civilizations how to avoid the ultimate loss of our freedom. It is important to us now because Americans are more dependent on a strong central government today than they have ever been. When we become completely dependent on the government for our economic security and advancement, we will have lost all our freedom. To the extent that we are now dependent, we have lost a measure of the freedom left to us by our predecessors.

The Widening Rôle of Government

THE March 18th issue of *Time* magazine, in a cover story on Carroll M. Shanks, president of Prudential Insurance Company, reported that

> Growing public desire for more security threatens his company with a new competitor far stronger than any within the industry; the U. S. government itself, which is steadily expanding social security and other federal welfare programs.

Why has the government shown such a strong tendency to expand? Perhaps part of the answer is that government is essentially an organization comimtted to carry out the will of the people, and a large portion of the people has been persuaded to vote for government welfare programs and "free" benefits, without pondering where the money will come from.

WE in the electric power industry discovered sometime ago that virtually all the attitudes which encouraged government expansion into the power business could be traced to a lack of knowledge of facts—facts that we had but had failed to pass on to the public. We found in our measurements of public knowledge and opinion that those who knew the least about our economic system were, in the main, those who were in favor of collectivist programs and government expansion. On the other hand, the more people knew about the free enterprise system the more they tended to be in favor of it.

Since the root of our problem lies in the public's lack of knowledge of basic economic facts, there is an obvious need for ways to communicate this needed information to it. We know that merely making the facts available is not enough. This information has been available for years, but it has not been assimilated. We have failed to simulate much interest in these facts on the part of the public.

A broader base of stock ownership and investment will result in a greater number of people with a personal interest in preserving our free enterprise system.

Through the medium of monthly investment plans, stock ownership has been made easier. We should look for more means of increasing the number of our citizens who have a personal stake in our free economy. We need more investors.

Rôle of the Investor

BEFORE the dawn of history man discovered that he could accomplish more work with the aid of tools. We began with tools made of wood, stone, and animal sinew. Later we progressed to the use of iron, bronze, copper, and other metals. Since the manufacture of these tools took time, he was forced to refrain from doing other things while he made them, or to bartering something of value for a tool made by someone else.

About the same situation exists today. People build up savings by foregoing pleasure or consumption of some sort. Having amassed savings, they can put them to work in our economy as tools.

Very simply stated, an investor is the person who supplies the tools, or the money used to purchase a tool. The investor expects to receive reasonable compensation for its use and for the risk involved.

It is by this means that the burden of supplying tools to our economy is placed on those willing to assume it. The supplying of tools is a large burden and a most important one. Every civilized society—Democratic, Socialist, or Communist—must have a large investment in tools.

Throughout history, man's progress has depended on the efficiency, quality, and number of his tools. Our standard of living has risen at the rate it has because we have consistently improved old tools and developed new ones. Our future growth depends upon our continued development of more and better tools.

SOVIET RUSSIA, too, is dependent on capital—the money used to buy tools. Russia also gets its capital from investors. However, there is a significant difference in the way Russia obtains the capital it needs and the way we in America obtain ours.

In Russia, people are forced to invest in industry. Since the state owns all business and industry of any importance, investment by free choice as we know it is impossible; but the government, through taxation or confiscation, still must turn to the individual for the funds necessary to supply the nation with tools. Soviet Rus-

¶ *"WE in the electric power industry discovered sometime ago that virtually all the attitudes which encouraged government expansion into the power business could be traced to a lack of knowledge of facts—facts that we had but had failed to pass on to the public. We found in our measurements of public knowledge and opinion that those who knew the least about our economic system were, in the main, those who were in favor of collectivist programs and government expansion. On the other hand, the more people knew about the free enterprise system the more they tended to be in favor of it."*

sia, since the end of World War II, has invested billions in new tools in an attempt to match, and ultimately surpass, the productive capacity of the United States. Should Russia succeed in this attempt she will simultaneously acquire military as well as economic superiority over us.

If American savers fail to supply the capital necessary to provide tools in the years to come, our government will be forced to adopt the same methods Russia uses, in order to guarantee that the Soviet Union does not achieve this superiority.

If these methods of financing should ever become necessary, America would find herself virtually a socialist state; the government would be on its way towards ownership of more and more industry and business. This inevitably means control of more and more of the wealth of our country and control over more and more jobs and occupational pursuits. Whether or not a man is permitted to hold a job might then depend on how he voted. We saw this happen in Germany under Hitler. When this has happened in America, the rights, dignity, and freedom of the individual will have been lost.

Taxes and Capital

In the years to come, America will need large numbers of people with savings to invest and an economic situation in which a reasonable return on investment is possible.

The present tax structure is such that saving is becoming increasingly difficult. Our present high taxes are, of course, a direct result of a high level of government expenditure. If a portion of the large sums which the government obtains by taxation could be saved and used to buy more tools, we would enjoy the benefits of increased production—more jobs, more and better products, a higher standard of living, and so on—without forming a dangerous and habit-forming dependence on a flickle government largess.

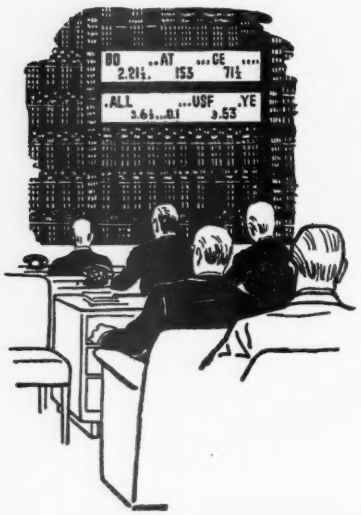
Senator Frank Lausche, former Ohio governor, has set an able example in working for a lower budget. He recently opposed a $5 million federal appropriation to help finance the 1959 Pan American games to be held in Cleveland. In an explanatory letter to Cleveland's mayor he wrote: "The federal budget must be cut. I cannot support for Ohio something which I would oppose for another state." Since that time, the citizens of Chicago have offered to assume this expense, and the project is thus being financed without calling on the U. S. taxpayer.

We must keep in mind that the government does not and should not produce anything. Its job is to protect our liberty. Sometimes our people need to be reminded that the federal government is not a Fairy Godmother with a bottomless purse, but a piper who must be paid and whose prices are usually quite high. It has been estimated that in some instances it costs the government about 39 cents to collect, handle, and distribute $1 in grants.

A Question of Free Choice

There is no important difference between the way our federal government raises money for government enterprises and the way the Soviet government, or any other government, raises funds for the same purposes. Taxes are taxes, the world over.

There is a major difference between the way American industry is financed and the way the Russians or any other



The Rôle of the Investor

"As the supplier of the tools which are used to manufacture every commodity and provide every service used by the American people, the investor is an essential part of America's economic system. By definition, the term 'investor' does not apply only to the professional coupon clipper or financial tycoon; every one of us who has savings in any form is an investor. The average stockholder is not a wealthy man; the beneficial owners of a large proportion of bonds are the policyholders of insurance companies, bank depositors, contributors to union trust and welfare funds, those who are providing for their retirement through pension funds, and many others."

socialistic society get the capital for its tools. The American way involves freedom of choice for the individual involved; people are free to invest or not to invest as they see fit. Once having invested, they are free to sell their interest at any time. The Russian system permits no freedom of choice whatever.

We have reached the point where, as a nation, we must decide which of these economic philosophies we will use to finance America's future needs for tools, machines, and factories. Continued refusal of the American people to take a consistent stand against "creeping Socialism" will result in the continued expansion of a welfare government.

The reason for this is that those who aim to socialize America are not likely to advertise every means by which they intend to collectivize the country. The American public will not be given the opportunity to vote for or against Socialism as such in one election, because those who favor a welfare state know that this would result in their sure defeat. They know, however, that people can be tricked into approving so-called "welfare" measures put before them one at a time, usually with a sugar-coating of some sort, or hidden in the fine print of a piece of worth-while legislation. These are the means by which the Socialists gained control of England a few years ago. Americans must learn to recognize Socialism, however it may be disguised.

The Need for Speaking Up

Those of us who are interested in preserving American freedom as we know it now must speak up every time we

spot a leftist power play. We must be quick to refute the claims of the social planners, the welfare state people, the socialists, the collectivists, the government ownership advocates. We must point out to the public the steps that governments, here and abroad, have taken in the past which have resulted in a loss of liberty for the individual. We must convince individual citizens, corporations, and local and state governments that they should stop looking to the federal government for financial aid.

Apathy Our Greatest Enemy

IT is the feeling of many observers that the trend toward the welfare state which has taken place in our country in the last generation has been sparked by only a comparative handful of people. The principal protagonists are, of course, the Communists, who are guided from Moscow.

They seek a peaceful purpose, to eliminate a clash of philosophies by eliminating one of the philosophies—ours. Associated with them in this effort are the Socialists, who want to establish a society in which a man's rank is decreed by the state or a political machine rather than by his own initiative and willingness to work hard for what he wants. Carried along with this red tide are a lot of well-meaning do-gooders, who feel they have an obligation to supervise the welfare of those whom they consider incapable of taking care of themselves.

These are the spark plugs of Socialism. They are alert to every issue, and are ready to take a stand on every question. They write their Congressmen religiously. They send letters to editors. They talk to their friends. They knock on doors and make phone calls in support of certain items of legislation. In short, they constitute a highly vocal minority. As a result, our legislative policy is more than slightly influenced by this group. Although they are only a minority, they swing the weight of a majority. They have demonstrated their ability to do so time and time again over the last generation.

THE reason they have been successful is that the rest of us have, by and large, remained silent. Unfortunately, we have no fear that our country will ultimately turn communist or socialist; we have confidence and an abiding faith in the judgment of millions of fellow Americans, each of whom is just as silent on the subject as we are. Somehow we have got the feeling that we are holding the fort, and that, like the ostrich with head in sand, we are secure in our passive faith in democracy. We are complacent about freedom and the rights of the individual. Nobody has oppressed us. We are still free.

We do not become alarmed at new developments in a new world. A $72 billion budget occasions a few extra sacks of mail to Washington, but is soon forgotten. Our share of the cost of government is deducted from our pay before we ever see it, so we are largely unaware of our tax burden; it is relatively painless. We hardly realize that $1 out of every $3 we earn goes to support government. We do not associate that with Socialism. We have been lulled to sleep by free-wheeling government policies and practices that advertise benefits and disguise detriments. With our dulled senses we find it hard to see possible sources of danger to our freedom and individual rights.

What Can the Investor Do?

As the supplier of the tools which are used to manufacture every commodity and provide every service used by the American people, the investor is an essential part of America's economic system. By definition, the term "investor" does not apply only to the professional coupon clipper or financial tycoon; every one of us who has savings in any form is an investor. The average stockholder is not a wealthy man; the beneficial owners of a large proportion of bonds are the policyholders of insurance companies, bank depositors, contributors to union trust and welfare funds, those who are providing for their retirement through pension funds, and many others. These investors can do many things to safeguard American freedom.

First of all, the investor can learn more about America's business enterprises. From a very selfish standpoint, it is to his advantage to keep advised of the progress of various industries, the demand for their products, and their competitive position, just for the sake of protecting his investment. In turn, this knowledge will lead him to invest his money where it is needed most—which is where it is likely to produce the greatest return commensurate with the risk involved.

This is a factor of great importance to our economic system. It insures that, according to the law of supply and demand, capital will flow where it is needed. This advances the building of a sound economy based on producing what the people want, and gives them those benefits which they select for themselves in the market place. In other words, it makes the free economy work well to meet the needs and desires of the people. The flow of capital into industry responds to natural stimuli arising in the market place. Where capital is allocated by any other system, including federal budgets and appropriations, whether or not it responds to those natural stimuli of supply and demand is purely coincidental. It may or may not produce what the people want. Its only requirement is that it produce what the planners want.

That is why Russia finds shoes and clothing in short supply, but there is plenty of steel.

Secondly, the investor can guard his own interest by being watchful for developments which impair the ability of our free enterprise system to continue to meet the needs of the people. Harsh, discriminatory taxes, for example, can penalize one commodity while the absence of such taxes encourages another. Excessive government supervision or control can make an industry a political football. This can operate to cause apparent discredit to our economic system. By keeping advised of these developments, the investor can call them to the attention of lawmakers and the public.

Third, the investor can hold himself ready to clear up misunderstandings on the part of his friends and associates as to the nature of a free economy. We know from experience that the more people know about the American economic system and the freedoms on which it is founded, the more strongly they are inclined to support our present system. The converse is also true: The less they know about it, the more they are inclined to favor collectivism. Make sure your friends and acquaintances do not harbor any mistaken ideas about the American

free market and its contributions to our present world leadership.

Another thing that the investor can do is keep a sharp eye on the management of American industry. Adoption of unwise corporate practices can cripple a business and render it less able to serve its customers well. The result is a loss of producing power which deprives the customer of additional products, and at the same time operates as a waste of invested capital, which might be more productive in our economy if invested elsewhere. The stockholder, through his proxy and his election of the corporate board of directors, has the power to control these practices, and he should do so, both to protect his own interest and to protect the nation's interest.

FINALLY, the investor can keep a wary eye on the activities of government which tend to assume some of the duties which should be left in private hands. The American industry thrives on true competition. Competition forms the heart of our system, and is what makes the American economy so responsive to the needs of the people. Our American efficiency, famous all over the world, is the product of competition.

When we talk of government competition, however, we are speaking of an entirely different concept, which is not really competition as we know it, in which everyone follows the same rules. This is an insidious operation capable of giving itself the most outlandish of competitive advantages. Through taxation and through the establishment of arbitrary and one-sided rules and regulations, the government can bring any industry to its knees, if the people allow it to do so. An organization clothed with power such as this cannot truly be called "competition."

We have seen that the people who favor government encroachment in the civilian economy are ready to speak out for their cause. The great majority of the people who wish to continue to live in a free country, where the government itself lives within the rules it has set for the people, are not inclined to oppose such plans vigorously, if those plans are adequately camouflaged and sugar-coated. It is only by continually exposing situations of possible danger that we can hope to preserve a free society.

There are many things that can only be done by the investor. Only he can do a competent job of the things mentioned. Since this work is peculiarly his, he has a responsibility which cannot be passed on to others. How well he discharges this responsibility could well mean the difference between freedom and domination. Let us pray that he has the wisdom and the courage to do it well.

PAST generations of Americans have jealously guarded their freedom. They have insisted on maintaining the boundaries which fence government in and prevent it from encroaching on the rights which the people reserved for themselves. They believed that the source of all power is the people, and they have tried to keep it there. Now it is our turn to take up the task. May God grant us the wisdom to see our duty, the courage to carry it out, and the determination to keep ourselves and our fellow citizens free of domination and dependency which has been the downfall of all the civilizations before us.

Partners in Industrial Research

One-fifth of the industry's research and development spending is being done by electric manufacturers. Much of this is being carried on as a partnership between the two branches of the electric industry—the manufacturer and the operating utility company.

By GWILYM A. PRICE*
CHAIRMAN AND PRESIDENT, WESTINGHOUSE ELECTRIC CORPORATION

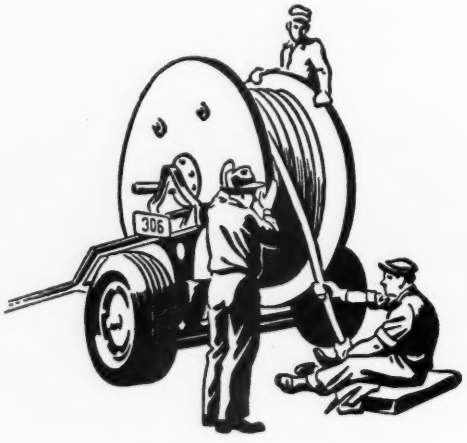
In 1957, the United States will spend about $6.3 billion on industrial research and development. We have spent more in that field since 1950 than we spent in the previous 180 years of our national history.

In 1920 we had about 9,000 scientists and engineers working on research in this country; today we have more than 200,000. In 1920 we had about 220 industrial research laboratories; today, more than 4,000 firms maintain such laboratories.

This is a comparatively new and strange factor in our economy. Industrial research as we now understand the term began only a few decades ago, and it began on the present massive scale within the past ten years. No nation has ever before made such an incredible investment in the systematic application of scientific knowledge to its industrial problems.

The development is not only new; it marks a revolution in scientific thought and method. American industry is engaged in nothing less than the unique attempt to mass produce scientific knowledge, and the technological end products of knowledge, by a procedure in which the research organization as well as the individual scientist is creative. Today research and development become relatively more important, as more and more com-

* For additional personal note, see "Pages with the Editors."



panies set up larger and larger research budgets.

THE electrical manufacturing industry has played a major pioneering rôle in this national research effort. Along with the chemical and pharmaceutical industries, we were the first to harness science in order to design new industrial processes and products. The scale of our technical effort today far exceeds that in every other industry except aircraft. Electrical manufacturers, either for their own projects or contract projects, are spending about 6 per cent of their sales income on research and development programs. That amounts to about *one-fifth of all the money* that American industry is spending in that field today.

The truly remarkable thing about this research effort is that much of it actually is being carried on as a partnership between two industries within the electrical industry—the manufacturer and the utility. I do not know how this pattern developed—whether it was by design or accident. Conceivably, the utility companies could years ago have initiated their own research and development programs and thus would be dealing today with the manufacturer simply as a supplier of products made to their design. But from the early days of our industry the utilities have recognized that the manufacturer must be much more than a fabricator. They have supported a continuing, growing research and development program with the two best aids at their disposal: participation in the work and purchase of the result.

Today, thanks to a decision made more than a half-century ago, research work in our industry is carried on primarily by the manufacturers. This arrangement has certain advantages to recommend it.

Today large groups of scientists must work together to achieve results. The old-fashioned inventor and uncommitted scientist have been replaced by teams of scientists conducting programed research. In the words of one well-known research engineer, "Most solutions are not clean; they involve more than one scientific discipline." Experts of various specialties — physicists, chemists, metallurgists, and others—must combine their efforts on a single project.

The productivity of these scientists is improved by use of some elaborate—and very expensive—equipment, such as the computers that are being used to make the calculations in the design of turbines. Researchers need freedom to work for many months, perhaps years, on exploratory investigations which may pay off in some stunning development in insulation or apparatus design—or which, on the other hand, may not pay off at all.

The chief recommendation of the way we do our research, of course, lies in the results we have achieved. The partnership has been an exceptionally fruitful one. Both segments of our industry have met the two requirements that are prime facts of business life in America today. They have raised the quality of the product and they have lowered its real cost.

WE see this in the new and improved household appliances and in the more efficient apparatus in today's power systems. We see it in a generating capacity that for more than half a century has met every demand that can be put upon it by boom, depression, war, postwar expan-

sion, cold war, atomic projects, and by what someone has called "our guaranteed annual increase in population." When we look backward, we see immensity of achievement in the simple but dramatic fact that of all electric power consumed in this nation since 1900, when turbines really entered the picture, one-half has been consumed since 1948. When we look forward, we see future achievement outlined in the equally dramatic fact that the electrical industry will grow enough by 1966 to power another United States.

THE two branches of our industry have succeeded in lowering the real cost of power by raising the productivity of the men and the efficiency of the machines that make the power. The electric utilities probably turn out more product per worker today than any other industry in America. Last year, you in utilities produced four times as much power as you did in 1939, and produced it with fewer employees. You did that with good management, hard work, huge investment, and some good apparatus developed by research.

I know of no better way to illustrate this productive partnership in research than by citing several projects that one electrical manufacturer has undertaken in co-operation with various utility companies. While the manufacturer happens to be my own company, the company I know best, these projects are representative of the good research and development being done by all the manufacturing companies in our industry that have facilities for such work.

THE first project involves metals. The future of the electric utility industry is bound up in peculiar and probably decisive ways with the advances we make or do not make in metallurgy. Further improvements in much of our equipment must wait on further improvements in alloys. That will take considerable research, development, and operating experience.

Now, the amount of special metals involved in our products is relatively small —too small, in fact, to be of much interest to the metals industry. For that reason, much of the metals research that is done for the electrical industry has to be done by the electrical industry itself.

Two years ago, to help meet this situation, Westinghouse built a metals pilot plant at Blairsville, Pennsylvania. The plant, which covers 205,000 square feet and employs 650 persons, has facilities

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for vacuum melting, hydraulic forging, hot rolling, cold rolling, conditioning, pickling, and heat treating, as well as for manufacture of powdered metal parts, shell molding, and the development of new casting techniques. Blairsville is a new link between the laboratory production of new alloys and their commercial production.

Projects under way in this metals pilot plant include development of a number of high-temperature materials designed to meet specific needs for steam turbines. We are working on molybdenum and titanium, high-strength alloys, resistance and expansion alloys, and nuclear alloys.

The metals pilot plant is producing components from which nuclear fuel elements are manufactured. These are made up largely of a zirconium "superalloy" which is highly corrosion resistant, has nuclear characteristics making it especially suitable for use in reactors, and is both strong and workable.

THE second research project also concerns metals. Back in 1930, scientists agreed that only by developing entirely new magnetic materials could they realize substantial gains in magnetic characteristics. But who would undertake such a development? The market potential for electrical steels at that time was too small to greatly interest most steel manufacturers. This again was a job which had to be supported in a major way by the electrical industry itself.

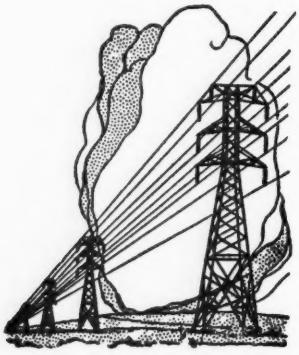
In 1930, Westinghouse, in conjunction with one of the major steel companies, began development work on grain-oriented silicon steel. After ten years of work, practical methods and techniques were found for the mass production and handling of a truly new magnetic material named Hipersil.

The effects of this new material have been most widely felt in the manufacture of transformers. It required a completely new approach to transformer design. The over-all result has been greatly improved transformers and savings to customers running into millions of dollars.

The third project I would like to mention—the Tidd experiment—involves a high degree of co-operation among a number of electrical manufacturers and utilities. Ten years ago, in order to determine the loss and radio influence under corona conditions on extra-high voltage lines, the American Gas & Electric Company, working in co-operation with a number of manufacturers, built a full-scale outdoor laboratory, including a 5,000-kilovolt-ampere bank of transformers.

Over a period of three years a great amount of data was accumulated under various conditions of operating voltage, conductor size and shape, and weather conditions. The information has produced a better understanding of the performance, economic design, and operation of extra-high voltage lines and substations.

THE final project I should like to describe concerns atomic power. In introducing this subject, I wish to point out that the utility industry is today bearing a substantial part of the research and development costs in the atomic power field. The great national need for speeding up the development of atomic generation has caused the electric utility industry to depart from normally established policies and many utilities are making great contributions to the development of nuclear power.



The Value of Research

"IF the research dollar continues to be as productive in the future as it has been in the past—and I am firmly convinced that it will—then the tremendous sums we are now investing will inevitably result in a series of developments greater even than those we have known up to now. New products will expand our markets. New processes and equipment will improve our quality, raise our efficiency, and lower our costs. Some of the great basic problems that remain in our industry may be solved. Major technical breakthroughs may open up whole new avenues of expansion and advance."

The application of nuclear energy to power generation provides many examples of research and development which are or will be important to utilities. As a matter of fact, a considerable segment of the work going on in the field of reactor technology is devoted to the design, development, and construction of reactor plants for use in central power stations.

Construction of the first full-scale nuclear-powered central station generating plant in this country, I am happy to state, is now proceeding on schedule. The plant itself and the installation of the equipment are approaching completion. The manufacture of the reactor fuel has been going on for about a year and will be finished during the summer. A very careful test program will be carried out and, barring unforeseeables, the plant will be in operation before the end of this year. At which time some people at the Duquesne Light Company, the Atomic Energy Commission, and Westinghouse will get a carefree night's sleep for the first time in several years.

LIKE the first major step in any new field, the Shippingport project provides a continuing succession of research and development activities. To use the nuclear fuel itself as an example, we had to develop the techniques for manufacturing

uranium oxide shapes suitable for use in a reactor. At the same time, we had to demonstrate the physical and chemical properties which make it a useful and reliable fuel material. Our reactor designers were then called upon to devise methods for containing and supporting more than 14 tons of fuel material uniformly distributed within a circular cylinder six feet in diameter and six feet in height.

We cannot measure Shippingport, of course, only in terms of its contributions to the specific problems which are being solved in its design and construction. Shippingport is, rather, a developmental and experimental tool. Out of the design and operation of this plant will come invaluable firsthand knowledge of the technology and of the component and system design. This knowledge will provide a firm, factual basis for the evaluation of future plants, and will give us a better understanding of both the economic and the technical factors involved.

WHAT is true of Shippingport is also true of the other and later reactor plants of different designs. The reactor now being developed for the 150,000-kilowatt Pennsylvania Power & Light Company plant, for example, will determine the technical feasibility of building a large aqueous homogeneous type reactor for central station use. The 134,000-kilowatt reactor being built for the twelve New England power companies that make up the Yankee Atomic Electric Company will demonstrate the technical feasibility of using a core of slightly enriched uranium oxide contained in stainless steel tubes. Since this is another pioneering project, a large developmental program is now in progress.

THESE, then, are some representative examples of research and development work in the electrical industry.

It is not enough that the research effort in our industry be continued. Our research effort must be increased.

We can move forward in research, or we can move backward, but we cannot stand still. Our research work is too closely bound up with our industrial economy for that. We are operating in that situation, normal to a dynamic free enterprise system, in which we have to run faster to stay where we are, and much faster to move ahead.

A study made by the National Science Foundation indicates pretty convincingly, along with other evidence, that there is a close correlation between growth rates of individual industries and the effort they put into research and development. A high rate of growth and improving productivity are both clearly associated with high research activity. It follows that certain industries—and ours is one—must steadily increase their research effort to keep up their rapid rate of growth.

Some electrical manufacturers spend very little on research. Others spend a great deal. There is an extraordinarily high degree of interchange of technical information in the electrical industry. A research and development department may spend years on a long, tedious, research and development program before it turns up a salable end product. The result may be presented to the trade under a proprietary name, but the advantage accruing to the developing company is short-lived. Once it is on the market, the new development quickly spreads throughout the manufacturing industry. In this respect our practices are almost like those of

ethical medicine, where it is neither desirable nor possible to withhold any major new development from general use.

THE other point I would make is simply that research is expensive and has to be paid for as one of the normal costs of doing business. The electrical manufacturers of this country are spending 6 per cent of their sales income on research and development. This figure is high—the second highest among all industries. But even so, it does not tell the whole story. It is like the average annual temperature of Amarillo, Texas. You do not get the whole story until you break it down. The large companies spend a great deal more than 6 per cent of sales on their technical effort.

Now, the electrical manufacturers have to obtain this money before they can spend it on research; and I am well aware of where the money actually comes from. In our capitalist economy, the customer pays for everything. Those who pay the research cost of the electrical manufacturers are those customers—including utility customers—who buy the products.

No money the utilities can spend will bring so great a return as this money spent, indirectly, on research. The research dollar is indeed the most valuable dollar being expended in America today. You get more value for the dollars you invest in electrical research than you do for any other investment you can make.

The greatest hazard our industry as a whole could face would be a drive to cut the cost of electrical equipment and apparatus to the point where research and development must suffer. Such a drive would perhaps produce short-range cutting of utility costs. But it would bring long-range losses that would be highly detrimental to the continued progress of our industry.

WE have a mutual stake in industrial research. It is to the interest of each branch of this partnership that we have both technical leadership and sound economic health for the electrical industry as a whole.

The money invested in research in the 1920's and early 1930's brought forth products that have given new life to our industry. The money we invested five to ten years ago is only now beginning to produce its new developments—luminescent lighting, central station nuclear power, and a host of others.

If the research dollar continues to be as productive in the future as it has been in the past—and I am firmly convinced that it will—then the tremendous sums we are now investing will inevitably result in a series of developments greater even than those we have known up to now. New products will expand our markets. New processes and equipment will improve our quality, raise our efficiency, and lower our costs.

Some of the great basic problems that remain in our industry may be solved. Major technical breakthroughs may open up whole new avenues of expansion and advance.

We have scarcely more than scratched the surface of what we can build and do, in harnessing electricity for the improvement of man's estate. The most exciting and most rewarding work remains to be done, and there is no doubt at all that, working together, we can do it.

Is the Holding Company Act Retarding Progress?

New economic and technical demands on the financing and organization of modern operating utility plant have revived the question of whether some of the present restrictions in the Holding Company Act against joint ventures are holding back much-needed plant progress and more rapid development in the nuclear reactor field, larger, more efficient conventional steam plants, and large hydroelectric developments.

BY THE HONORABLE EUGENE S. LOUGHLIN*
CHAIRMAN, CONNECTICUT PUBLIC UTILITIES COMMISSION

THERE is no question, at this late date, that there were plenty of grounds for reforms sought to be accomplished in the Holding Company Act. There *were* real abuses to be remedied. There were the "milking machine" techniques for fanciful service and management charges imposed on controlled subsidiaries as operating expenses. There were the controlled sales of property between affiliates and resulting "write-ups" of rate base values. These two classes of abuse were more readily corrected by the regulatory powers granted to the Federal Power Commission over interstate operations rather than by the Holding Company Act, as such.

The principal changes brought about by the Holding Company Act were the elimination of the old pyramided multitiered holding company controls, and the breaking up of scattered and otherwise unnecessary system controls. This was accomplished by the geographic integration and corporate simplification provisions of § 11, which came to be known as the "death sentence." Incidentally, those who protested the use of that nickname as an unwarranted smear on the real objective of the act might reflect today on the actual disappearance of the holding companies. Whether we prefer to call them dead, or

* For additional personal note, see "Pages with the Editors."

merely pulverized, it is a fact that only a handful remain today. The reforms of corporate reorganization which the SEC was set up to do are now accomplished.

THIS brings up the question whether the accomplishment of these reforms has not left a vacuum on the statute books. Unless present obstructions are removed so as to permit a more realistic attitude toward electric utility plant operations under modern conditions, such a vacuum cannot be eliminated.

More to the point, however, is the question of whether the technological trend toward larger electric generating plants will not eventually demand co-operative efforts of private enterprise companies, if these activities are to be kept in the realm of private enterprise.

Yet when business-managed companies seek to join forces for purposes of joint financing, and other co-operative efforts, they find themselves blocked by provisions still left on the statute books by the old Holding Company Act. We know that these provisions were enacted to bring about reforms long since accomplished, and prevent abuses which could not possibly reoccur under present built-in safeguards of modern regulatory practice, both state and federal.

It is also a strange fact that in the case of no other industry, even public utility industries, has our federal government adopted a policy of deliberate discouragement of large-scale corporate organization regardless of the economies and efficiencies involved. The Bell system conducts our telephone industry with respect to 85 per cent of the business, and 85½ per cent of all telephones. Congress deliberately and specifically authorized the merger of Western Union and the old Postal Telegraph system in the telegraph business. Railroads, airlines, and other interstate carriers may likewise consolidate or engage in joint operation under federal regulatory commission authority.

Even among highly competitive, nonutility industries, the federal policy under the antitrust laws has not been to penalize or prevent economy or efficiency as such, but only to prevent monopolistic conditions contrary to public interest from developing.

IT must be stated, of course, in all fairness that the Holding Company Act did not outlaw "bigness" per se. It did not even outlaw holding companies, as such. But it placed so many and such varied restrictions around the continued operation of such holding companies in the gas and electric utility field that most of them have had to go out of business because they could not reorganize, so as to meet the regulatory standards of the act. In the main, these standards were designed to limit holding company operations in the gas and electric utility field to those which could be proven economically and geographically integrated. And, finally, it had to be shown that the economic advantages of the surviving combination were such that there would be an actual loss of efficiency or economy if the common control were not permitted to exist.

Even where such a combination can justify its continued existence under the Holding Company Act, the result is, to a large extent, an expensive and burdensome duplication of regulation which is superimposed on many companies already subject to the Federal Power Commission under the Federal Power Act, or to state

regulatory commissions under state laws, or both. This is in itself a deterrent and an obstruction which can hinder companies seeking to make plans for organizing, financing, and constructing system operations along lines which would otherwise be naturally dictated by technical and financial economies only.

FURTHERMORE, regulation under the Holding Company Act is a sort of liquidating type of regulation, obviously designed to encourage the breaking up of gas and electric utility systems into smaller area operations. The FPC regulation under the Federal Power Act, on the other hand, recognizes and encourages coordinated operations which result in savings in operating costs. Such savings may occur in a number of categories, including (1) production costs through increased hourly use per day of lowest-cost generating units; (2) increased usage of water which would be wasted without joint operation; and (3) increased generating reserves, through the combination of load requirements of interconnected systems and the use of lowest-cost facilities available to such a combination.

TESTIFYING before a subcommittee of the Senate Interstate and Foreign Commerce Committee a year ago, Chairman Jerome K. Kuykendall of the Federal Power Commission stated, with reference to such possible economies:

> When a commission study discloses that the sum of such benefits exceeds the costs of the transmission lines, terminal, and other associated facilities required to effectuate the interconnection and co-ordination, a favorable opportunity for interconnection is indicated and interested parties are advised through distribution to them of copies of reports prepared by the staff of the commission.
>
> Recent interconnection and co-ordination studies made pursuant to § 202 (a) of the Federal Power Act, as well as some of those now in progress, strongly indicate the need in some cases for construction of unusually large steam-electric generating stations because of the decreasing number of power plant sites available where there is adequate cooling water and where fuel may be obtained at relatively low costs.

¶ "THE *principal changes brought about by the Holding Company Act were the elimination of the old pyramided multi-tiered holding company controls, and the breaking up of scattered and otherwise unnecessary system controls. This was accomplished by the geographic integration and corporate simplification provisions of § 11, which came to be known as the 'death sentence.' Incidentally, those who protested the use of that nickname as an unwarranted smear on the real objective of the act might reflect today on the actual disappearance of the holding companies. Whether we prefer to call them dead, or merely pulverized, it is a fact that only a handful remain today.*"

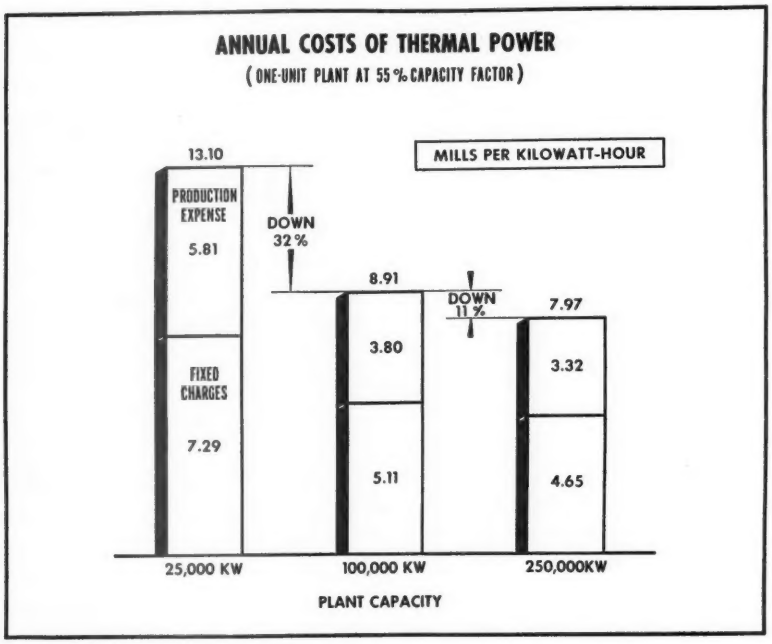
For example, in New England suitable power plant sites at tidewater are becoming scarce, very costly, and very difficult to acquire. Consequently, present studies now under way indicate that most economical use of available power plant sites requires the construction of unusually large generating stations at such sites as are available.

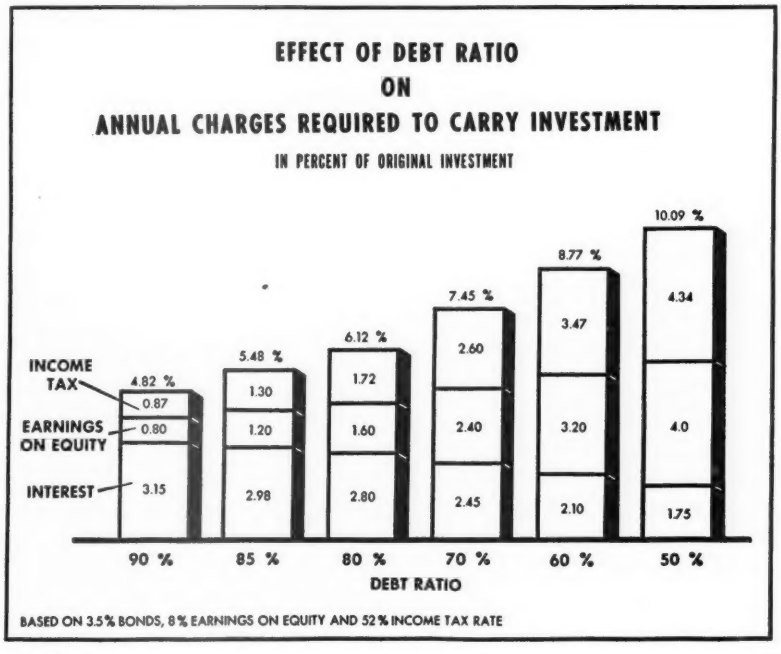
Similarly, in some parts of the southeastern and central regions, transportation costs are so large a part of the total cost of fuel used for generation of electric energy that the most economically suitable steam-electric plant sites are usually limited to those on navigable waters. In both cases the greatest economy in production of electric energy is achieved when very large steam-generating stations with large units are constructed at such suitable sites as are available.

In other words, the joining of two or more electric operating companies in the construction of large-scale plants, both hydro and steam, in many cases is more economical than for any of these companies to act alone. It is for this reason that Chairman Kuykendall, testifying favorably on a bill (S 2643) to amend the Holding Company Act, referred to the need of such exemption. This bill would exempt electric utility combinations seeking to develop nuclear reactor plants or other large-scale electric plants. The author of the bill, Senator Pastore (Democrat, Rhode Island), made it clear at the outset that its purpose was to improve the practical operation of the Holding Company Act in the light of present-day requirements, but not to "change or subvert the basic principles and philosophies" of that law. Chairman Kuykendall stressed the fact that such joint operating combination, even by four different companies in four different states—with respect to a single large power plant in only one state—would be subject to the continuous jurisdiction of the FPC.

Testifying on the same bill as to the intrastate phases of such operation, I pointed out that state commissions have regulatory authority under state law. Referring to Senator Pastore's bill, I said:

> Any legislation such as this which will foster the development of atomic reactor generating companies and jointly sponsor conventional or atomic power projects with a resultant increased supply of low-cost energy seems to me so obviously in the public interest that arguments against its passage are unsound.
>
> It is axiomatic that duplicate regulation of utilities results in increased costs, which of course must be borne by the customers of the utilities. I am convinced that if there is adequate state regulation there is no need for duplicating federal regulation.
>
> When the Holding Company Act was passed in 1935 the regulation of utilities by states was not as extensive and comprehensive as it is today. . . .
>
> No one in my opinion should advocate legislation to amend the Holding Company Act which would result in repetition of the abuses which led to the act's passage in 1935 or would result in a regulatory gap. If I thought that such would occur upon the passage of S 2643 I would be the first to oppose its adoption.


ANNUAL COSTS OF THERMAL POWER
(ONE-UNIT PLANT AT 55% CAPACITY FACTOR)
MILLS PER KILOWATT-HOUR
13.10
PRODUCTION EXPENSE
5.81
FIXED CHARGES
7.29
DOWN 32%
8.91
3.80
5.11
DOWN 11%
7.97
3.32
4.65
25,000 KW
100,000 KW
250,000KW
PLANT CAPACITY


EFFECT OF DEBT RATIO
ON
ANNUAL CHARGES REQUIRED TO CARRY INVESTMENT
IN PERCENT OF ORIGINAL INVESTMENT
INCOME TAX
EARNINGS ON EQUITY
INTEREST
4.82 %
0.87
0.80
3.15
5.48 %
1.30
1.20
2.98
6.12 %
1.72
1.60
2.80
7.45 %
2.60
2.40
2.45
8.77 %
3.47
3.20
2.10
10.09 %
4.34
4.0
1.75
90 %
85 %
80 %
70 %
60 %
50 %
DEBT RATIO
BASED ON 3.5% BONDS, 8% EARNINGS ON EQUITY AND 52% INCOME TAX RATE

Senator Pastore's bill did not pass in the old 84th Congress, although it did open up and educate congressional and public opinion to the need for re-examining the Holding Company Act and the need for bringing it up to date. Such an extensive change requires time. Similar legislation is expected to be considered by the 85th Congress.

As to the economies of large-scale plant operations, consider the testimony of Maurice R. Scharff, well-known consulting engineer of New York city. Referring to improvements in the art of electric generation by the use of steam, Scharff said:

> Some of these technical improvements are readily available only in connection with units of larger capacity. For example, there is no standard turbogenerator using reheat economically available on the market at capacities less than about 50,000 kilowatts, and except where fuel costs are relatively high in the use of reheat may not be economical except in units of larger capacities.
>
> Designs involving higher and higher pressures and temperatures and multiple reheat also become economical only at larger capacities where the savings in fuel, due to increased efficiency, offset the increased cost of construction for such improved facilities. . . .

Scharff summarized charts which indicated reductions of 30 per cent in construction cost and 32 per cent in annual cost for a 100,000-kilowatt single-unit plant, compared with four 25,000-kilowatt single-unit plants. He went on to refer to a chart illustration indicating that construction costs of 19 per cent and operating costs of 18 per cent could be made for a 400,000-kilowatt plant compared with four 100,000-kilowatt plants. Going up the scale still further, he stated that a 15 per cent cut in construction costs and a 20 per cent cut in operating costs could be made for a 266,000-kilowatt unit compared with four 66,000-kilowatt units. Even in the upper limit of a 1.6 million kilowatt plant there is an indicated cut of 4 per cent in both construction and operating costs compared with four 400,000-kilowatt plants. Who can tell what tomorrow will bring in the further progression of these obvious technological trends?

In the light of such new technological developments and our dynamically expanding national economy, does not Congress have a very real responsibility for re-examining the Holding Company Act? It is axiomatic that kilowatt-hours—cheap, reliable, and readily abundant—supply a major key to industrial expansion and higher standards of living. The requirement upon the electric utility industry to keep abreast and ahead of the national kilowatt-hour needs is a grave public responsibility.

From the very beginning when Thomas Edison first threw open the doors of the old Pearl Street station in New York city in 1882, the private enterprise system has always been faced with the challenge of that responsibility for public service. Except for the barriers of old laws never intended to meet such situations as now exist, there is no reason to suppose that the private enterprise utility industry will fail at this late date to meet the nation's needs for an adequate and efficient low-cost power supply. It never has before. But it could, if it were crippled badly enough by obsolete legal obstructions.

Consider the record of what the electric utility industry has done in the past. In 1937 the installed generating capacity of investor-owned utilities was 31.9 million kilowatts, in 1955 the figure had jumped to 86.9 million kilowatts—almost trebled in only two decades. The FPC has recently projected estimates of loads for all utility systems from 1955 through 1980. This picture shows that whereas the peak in 1955 for all systems, public or private, was 100.7 million kilowatts, the peak in the year 1980 will be 335.3 million kilowatts, more than trebling the present load.

To solve the problem of finding the huge blocks of power needed in the future, there is a growing demand for joint generating co-operation between two or more electric utility operating companies. Joint generating companies are needed. Here are some of the reasons:

1. The more efficient steam-*generating* plants are 100,000 kilowatts of capacity and larger. Such a plant of 100,000 kilowatts would cost about $18 million. But the additional output of a 100,000-kilowatt plant would be too great, if put to maximum efficient use, for most electric utility systems to absorb by load growth in a reasonable period! Also, 56 per cent of all systems have a maximum load peak of 125,000 kilowatts or less. Of all unaffiliated systems more than half have plant accounts of less than $50 million, suggesting that they would have difficulty financing a unit of such size. However, two or more electric utility companies getting together to build a joint generating plant would obtain a lower-cost supply of power for their customers. Is the answer, therefore, to encourage the union of such co-operative operations?

2. The lower relative cost of financing large projects can result in substantially lower kilowatt-hour production costs. A joint generating company enjoying long-term contracts for capacity output could be financed at a large low-cost debt ratio. (For example, the $400 million OVEC company, with long-term contracts with the AEC, was capitalized at 95 per cent debt and 5 per cent equity.) A ratio of 85 per cent debt to 15 per cent equity should prove a reasonable and safe balance for joinder generating companies. This cost-of-money savings would automatically be reflected in lower costs per kilowatt-hour.

❦

¶ "CONSIDER *the record of what the electric utility industry has done in the past. In 1937 the installed generating capacity of investor-owned utilities was 31.9 million kilowatts, in 1955 the figure had jumped to 86.9 million kilowatts—almost trebled in only two decades. The FPC has recently projected estimates of loads for all utility systems from 1955 through 1980. This picture shows that whereas the peak in 1955 for all systems, public or private, was 100.7 million kilowatts, the peak in the year 1980 will be 335.3 million kilowatts, more than trebling the present load.*"

3. The growing scarcity of sites at tidewater, on navigable streams and areas using ground water as a coolant, is a new factor of increasing sensitivity. The need for an ever-available supply of large quantities of water as a coolant in thermogeneration of electricity is becoming increasingly important to the electric utilities.

As power demands increase with greatly enlarged requirements, the scarcity of such sites is becoming more apparent. Indeed the matter is the subject of serious concern of the FPC, as noted in testimony before the Interstate and Foreign Commerce Committee of the Senate on April 19, 1956, by Chairman Kuykendall. The FPC chairman pointed out that as available sites diminish in number their maximum use should be attained by installation of maximum capacity units.

4. Large-scale hydroelectric development falls in a somewhat similar category. Growth of population and of load demands has made certain projects economically feasible for area-wide development by two or more companies but often are too large for the individual operating company. Chairman Kuykendall's remarks on this aspect are brief and to the point:

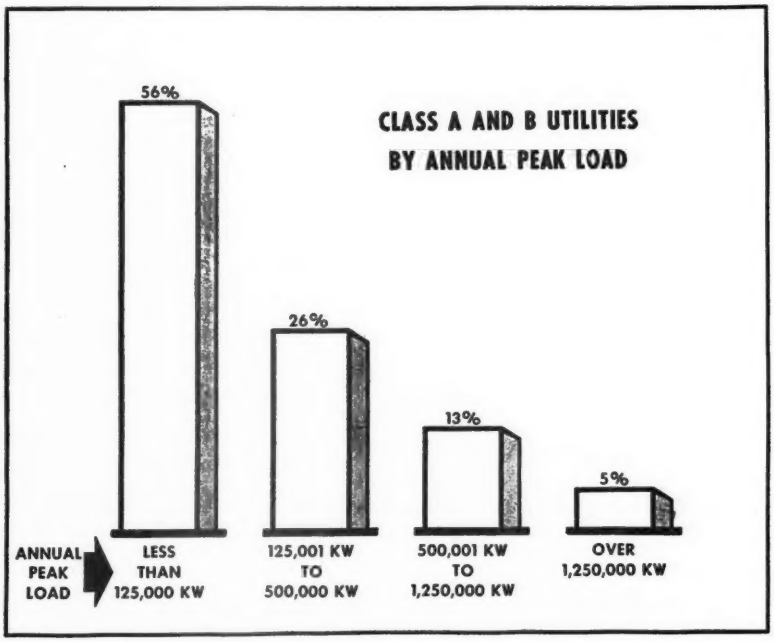
> So also there are available suitable sites for large hydroelectric projects in some areas in which there are no sites available for smaller projects, and realization of the economies obtainable through their development may similarly be dependent upon joinder of two or more electric utility operating companies.

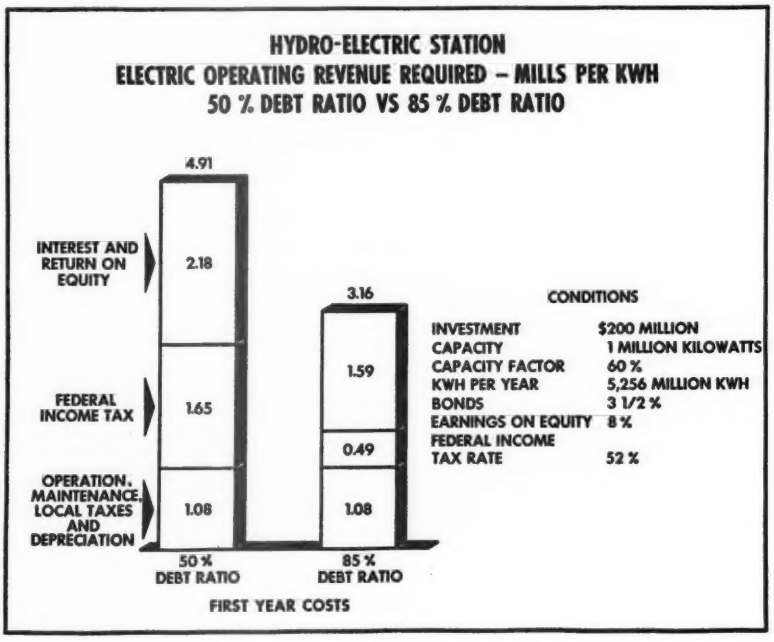
5. In the present development of the art of generating electric energy from nuclear heat only the largest size plants (to be tied in with two or more adjacent utility systems) are generally considered to be practical. For a long time to come the joinder electric utility generating plant for atomic energy generation will be the logical solution from the standpoint of private enterprise.

Under the Holding Company Act of 1935 the creation of such joinder generating companies would automatically render the sponsoring companies in the legal position of holding companies as defined by the act. It would place on the sponsoring companies, which would be in fact true operating companies, the obligation to conform with many unrelated regulations. Its subsidiary company, the joint generating venture, would not be allowed to enjoy the cost saving financial opportunities afforded many other companies in similar situations. Because of the conditions of their corporate state charters some companies would be unable to participate in such joint ventures.

Of course, the factors that have arisen in the last twenty years to create the necessity for joint generating systems did not exist at the time the Holding Company Act was enacted and could not have been anticipated.

The Public Utility Holding Company Act of 1935, when it became law more than twenty years ago, was not designed to meet a situation where two or more electric utilities propose to join their resources to provide themselves with necessary generating facilities. The art of metallurgy had not been perfected to accommodate the high pressures and the tremendous high degrees of heat which are presently commonplace. As already


CLASS A AND B UTILITIES
BY ANNUAL PEAK LOAD
56%
26%
13%
5%
ANNUAL PEAK LOAD
LESS THAN 125,000 KW
125,001 KW TO 500,000 KW
500,001 KW TO 1,250,000 KW
OVER 1,250,000 KW


HYDRO-ELECTRIC STATION
ELECTRIC OPERATING REVENUE REQUIRED – MILLS PER KWH
50 % DEBT RATIO VS 85 % DEBT RATIO
4.91
3.16
INTEREST AND RETURN ON EQUITY
2.18
1.59
FEDERAL INCOME TAX
1.65
0.49
OPERATION, MAINTENANCE, LOCAL TAXES AND DEPRECIATION
1.08
1.08
50 % DEBT RATIO
85 % DEBT RATIO
FIRST YEAR COSTS
CONDITIONS
INVESTMENT $200 MILLION
CAPACITY 1 MILLION KILOWATTS
CAPACITY FACTOR 60 %
KWH PER YEAR 5,256 MILLION KWH
BONDS 3 1/2 %
EARNINGS ON EQUITY 8 %
FEDERAL INCOME TAX RATE 52 %

stated, its basic purpose was to break up holding company systems, to eliminate scatteration, and to accomplish corporate simplification. These objectives have now been accomplished and, in keeping with the spirit of the Holding Company Act, regulatory jurisdiction over operating utilities has been returned to the states. States have, beginning with the thirties, provided comprehensive regulatory safeguards which were not in existence when the Holding Company Act became law.

LAST year the SEC objected to Senator Pastore's bill because it would exempt companies by general definition. Can this objection be met? It can. A group of companies could organize and own a generating company and could *apply* to the SEC for an exemption from the provisions of the act.

New legislation could be based on such applications. If the SEC found that such an exemption was in the interest of investors, consumers, and the public, it could grant the applications, subject to any conditions it believed necessary.

To safeguard public interest the following conditions could be required. It would have to be shown definitely that

(1) The generating company was engaged solely in the generation and transmission of electric energy and not in the distribution of electric energy;

(2) the facilities of the organizing companies and of the sponsoring companies were physically interconnected and located in the same geographical area;

(3) the organizing companies purchased the entire output of the generating company; and

(4) the issuance of securities by the generating company and by each of the sponsoring companies was subject to approval by a state or federal commission.

Nothing in this proposed amendment would affect the SEC jurisdiction over companies which are holding companies in the conventional sense. Any exemption granted could be revoked upon a showing that the facts upon which it was based had changed. All of the laws administered by the SEC for the protection of investors would be kept intact under this proposal.

". . . the proponents of government control constantly seek to sell their viewpoint by appealing to the personal financial interest of the individual by telling him that their way is better for him.

"The only way we can effectively meet that type of propaganda and preserve the free market economy which has made this nation great is by persuading people that it is in their long-term interest to keep the free market economy, no matter how much various pressure groups might gain temporarily by destroying it.

". . . we of business are in a peculiarly strong position in this respect if we will simply make our position understood. We do not need to resort to propaganda, or even to argument. All we need to do is to resort to the facts and see that the facts are known, for in the facts lies the complete answer to these specious and theoretical arguments."

—HAROLD BRAYMAN,
Director, public relations department, E. I. du Pont de Nemours & Company.

Air Conditioning and Its Electric Requirements

One of the most important fields of new business and power consumption still remaining to be fully realized by the electric utility industry is air conditioning.

By G. T. KELLOGG*

An almost 90-degree "about-face" by the nation's electric power industry in its attitude toward use of electricity for space heating—the heating of homes, offices, stores, and factories—is one of the phenomena of our rapidly changing and developing national economy.

As recently as five or six years ago, many electric utilities not only did not want electric heating business—they recommended against it.

Today nearly every big utility in the country is carrying on studies and surveys and sales promotion campaigns and public relations drives to sell electric heating.

To most readers of PUBLIC UTILITIES FORTNIGHTLY, many of the reasons behind the changed attitude are all too familiar, as are the reasons for the antielectric heating policy that preceded the switch.

The fantastic growth in public acceptance of air conditioning is, of course, a primary factor, but with overtones and undertones.

Rates and costs of production, it is understood, were high on the list of reasons for slight interest in electric space heating in pre-World War II days. Few people gave it a second thought, and if they did they were soon discouraged.

However, by the end of the war, there was some thought being given to it, and there were some installations. Typical of the attitude of many utilities in these early postwar years was that of the Virginia Electric & Power Company.

"After World War II," says Tom D. Fulford, vice president of Vepco, "many

* Staff member, Air-Conditioning and Refrigeration Institute, Washington, D. C. For additional personal note, see "Pages with the Editors."

of the small speculatively built houses in Norfolk, Newport News, and Alexandria communities of our service area were equipped with so-called radiant heat in the form of glass panels as the primary source of home heating. Several building contractors had discovered that installation of this form of heating equipment was less expensive than the more conventional types, and would help keep building costs down.

"UNFORTUNATELY, in too many of these homes, the equipment did not meet the capacity requirements, and the thermal insulation was much less than adequate. As a result, the purchasers of these homes found themselves saddled with high heating bills and were uncomfortable besides, during periods of extreme low temperatures. Of course, they came to us with their complaints, and there was little we could do but tell them they had been misinformed about electric heating. Naturally, this was completely unsatisfactory as an explanation, and it left us with a number of disgruntled customers.

"During the postwar years, we were experiencing a pronounced winter evening peak, and we had good reason to believe that this heating load came at about the time of our system peak, with a low annual load factor. A study of the electric heating installations made by the company disclosed that the annual load factor of electric space-heating customers was around 14 to 15 per cent, with individual customer maximum demands averaging about 10 kilowatts.

"In view of these situations of customer dissatisfaction, and the nature of this load, we took a dim view of this business both from the company and the customer standpoint. In 1948 our system sales department issued a memorandum urging sales personnel in all of the company districts to 'discourage each proposed installation of residential heating.'"

But by the early 1950's, the growth of the summer market made such an impression that many utilities began to do some soul searching—if they were going to have to step up production to meet the summer loads, perhaps they had better look into the creation of a winter demand to match them.

As their soul searching continued, the summer peak kept getting higher, with the result that in August, 1956, the nation's electric power output soared to a record 11,794,000,000 kilowatt-hours in one week. It was the first time that nationwide power demand during the summer exceeded the winter season. The figure was almost 10 per cent over a similar period in 1955, and eclipsed the previous record, established during the week before Christmas, 1955.

And this year's summer peak will be even higher, according to authorities.

Contemplating the growth of air conditioning and its current and future demands on the electric power industry, George S. Jones, Jr., managing director of the Air-Conditioning and Refrigeration Institute, a few months ago pointed out that total horsepower added to the nation's utility load in 1956 by air conditioning alone approximated about 3,750,000.

REFERRING to a forecast by an industry publication which predicted that this annual addition to the electric utilities' load would reach 6 million horsepower by

1963, Mr. Jones said he felt that it was "a modest estimate," on the basis of the growth of the industry he represents, and added, in a discussion with electric utility officials:

> Wouldn't it be wonderful if this were only a year-round load? Through the heat pump it could be, and through electric space heating you could get the same result in the area of year-round utilization of facilities.

By the time the new summer peak was reached, the soul searching of the previous few years had been translated into action, and electric heating was beginning to be installed, primarily in the South. Those areas, such as the Tennessee valley, which had low rates were perhaps the first to get into the heating picture, followed by some other areas in the South where winters are moderate.

But today, electric heating is not confined to the South—it is becoming nation wide. One of the high-use areas is the Pacific Northwest; another is the upper Midwest, and quite a number of companies have 1,000 or more homes on their lines heated by electricity, either resistance heat or heat pumps, in various parts of the country.

Electric space heating may be said to have passed through the experimental stage, and many of the contentions that it would never take the place of heat supplied by the combustion of fuels have been forever stilled. But even the most optimistic of the electric heat proponents do not see the fuel-burning furnaces and boilers being replaced overnight—or even in the next decade—by electrical heating devices.

At the same time, the electric industry has become truly aware of the market's potentialities, as evidenced by the fact that a two-day "Space Heating and Heat Pump Conference" last December in New York brought out appraisals and discussions by some of the industry's leaders. One utility speaker at the conference pointed out:

> It is an interesting bit of information to know that manufacturers of competitive fuel equipment discuss at national conventions the fact that electric heating is making inroads on their business. Likewise, it is most interesting to note that suppliers of competitive fuels recognize the impact of electric house heating. Last year at the American Petroleum Institute meeting

¶ "An *almost 90-degree 'about-face' by the nation's electric power industry in its attitude toward use of electricity for space heating—the heating of homes, offices, stores, and factories—is one of the phenomena of our rapidly changing and developing national economy. As recently as five or six years ago, many electric utilities not only did not want electric heating business—they recommended against it. Today nearly every big utility in the country is carrying on studies and surveys and sales promotion campaigns and public relations drives to sell electric heating.*"

> . . . a paper was presented, "Why Electric House Heating Will Become a Strong Competitor of Fuel Oil." Recently, in a national publication, an article appeared, written by the head of an eastern utility, entitled "Why Gas Cries the Blues."

However, there are many difficulties to be overcome before the day of the truly "all-electric" home or building. Indeed, that day may never come for the entire country—or at least its advent will be delayed until present fuel reserves are near the point of exhaustion.

The gas industry, for instance, is not only fighting hard to retain its winter heating market, but is developing equipment aimed at "helping" electricity to level off its summer peak. Efforts of the gas industry to develop air-conditioning equipment, and thus get a share of the vast summer cooling market were described in PUBLIC UTILITIES FORTNIGHTLY in the fall.[1]

THE gas industry is spending millions to put itself in the race for the summer cooling dollar, and already a number of manufacturers in the field have developed and are marketing efficient gas-powered air-conditioning equipment at competitive prices.

At the same time, gas as fuel for space heating has only recently gained ascendancy over competing fuels, and this primacy will remain with it for many years if the money, research, time, effort, and brains of this industry continue to be spent in the developmental work that marks its current activity.

(American Gas Association reported late in 1956 that gas had become the No. 1 fuel for the central heating of homes for the first time. Gas claimed 10.2 million dwellings in mid-1956, compared with 10.1 million for fuel oil and 7.5 million for coal. Spread of natural gas pipelines since 1951 has nearly doubled the number of homes heated from this source in the past six years.)

On the other hand, some observers have expressed the thought that regulations of the Federal Power Commission are pricing, and will continue to price, natural gas so low, in competition with other forms of energy, that this resource may be depleted at a rate inconsistent with good conservation methods. These advocates of higher rates aimed at conservation of gas are somewhat in the nature of voices in the wilderness, for the gas industry, understandably, would like to see rates increased but with no thought of curtailing the selling of fuel for any and all purposes that can be devised to use it.

HOWEVER, regardless of the question of rate regulation, another school holds that even though depletion of natural gas resources is being accelerated by fast selling and development of new uses for the fuel, why shouldn't they be depleted, since development of electric space heating—particularly through use of the heat pump, and the fact that nuclear power is no ephemera—will take over some time in the future anyway. This school holds that we may as well use up the gas while it is plentiful—nuclear and solar energy will make it obsolete soon enough.

Undoubtedly the electrical industry will continue to develop all manner of devices designed to use electricity for space heat-

[1] "Gas Air Conditioning, Today and Tomorrow," by George S. Jones, Jr., October 25, 1956, issue, p. 678.

Spread of the Heat Pump

"A SURVEY of the nation's electric utilities late last year indicated that there were about 12,000 heat pumps in use in the nation at the end of 1956, about half of them sold in 1956. Of the total, about 60 per cent were estimated to be in homes and 40 per cent in commercial buildings. Sales of around 11,000 or 12,000 are expected in 1957, bringing the anticipated total in use by the end of this year to the neighborhood of 25,000. It is difficult to project the heat pump too accurately into the future because of many factors, but an indication that 100,000 will be in use by the end of 1959 has been heard in the industry."

ing, and in all probability electricity will "move in" on a portion of the heating market now occupied by other fuels. How soon and how much would be difficult to answer at this point. Both gas and electricity have research teams working on improvement of the equipment which uses their form of energy—for both heating and cooling, as gas tries to create a summer market to offset winter peaks, and electricity tries to enlarge its winter market to offset the newly developed summer peak.

Although they are interested in resistance and other types of electric heating, the electric utilities' primary interest in the heating business seems to center around the heat pump, as already indicated.

As almost everyone in the industry knows, the heat pump is an air-conditioning installation with a reversible cycle, which enables it not only to freeze the heat out of the air to cool an enclosed space in summer, but, thrown into "reverse gear," to extract heat from outside air, water, or earth in the winter and pump it back into the enclosed space to heat it.

THE power industry's great interest in the heat pump is evidenced by the committee work being carried out in the field. For example, the activities of the joint heat pump committee recently were expanded so that it could continue its research looking toward further improvements in efficiency and utilization. Also, on the current agenda of the Edison Electric Institute's electric space-heating and air-conditioning committee are such projects as the "Architects' Space Heating and Heat Pump Handbook," and customer heat pump and electric space-heating handout booklets. In addition, the committee is issuing reports on heat pump promotions by electric utilities, and has issued a report consisting of heat pump data sheets, including both commercial and residential installations.

Where is the heat pump today, and what are its prospects for growth in the future?

A survey of the nation's electric utilities late last year indicated that there were about 12,000 heat pumps in use in the nation at the end of 1956, about half of them sold in 1956. Of the total, about 60 per cent were estimated to be in homes and 40 per cent in commercial buildings.

Sales of around 11,000 or 12,000 are expected in 1957, bringing the anticipated total in use by the end of this year to the neighborhood of 25,000.

It is difficult to project the heat pump too accurately into the future because of many factors, but an indication that 100,000 will be in use by the end of 1959 has been heard in the industry. This forecast may be off on the side of modesty, since many manufacturers of air-conditioning equipment are expanding into the heat pump field—a "natural," since the heat pump is merely a further application of the "refrigeration cycle" with which their industry has been familiar since the days of the clanking ice-making machines.

THESE manufacturers foresee a bright future for the heat pump as a "year-round" air conditioner that does not require fuel combustion for the heating phase, as do presently produced 12-month installations.

An official of the industry has said that the heat pump will contribute more to the economy of electric utilities as a direct result of sales and use of power than any other single electrical item sold for the home.

Until recently, the initial cost of heat pump installation was a deterrent to its widespread use; in many areas cost of operation was a deterrent, and may be still so considered by some. However, the number of installations even in northern sections has continued to increase, and as the product is improved and costs are reduced, may be expected to burgeon in other areas as it already has in Florida and some of the nearby states.

Although one usually thinks of the heat pump as restricted to large installations, or at least to central residential applications, this is not entirely the case, and if the plans of some manufacturers carry through the small "zonal" unit may become as ubiquitous as the room air conditioner. A few room air conditioners already are being built with reverse cycles, as well as with built-in resistance units, and since the several million room air conditioners now in operation in the United States are responsible for a good portion of the summer electric line load peak, development of this phase should be of more

than passing interest to the electrical utilities seeking to offset this peak.

On the subject of reverse cycle room air conditioners, Paul M. Augenstein, general manager of General Electric Company's room air conditioner department, told the New York conference referred to above:

> The subject "Reverse Cycle Room Air Conditioners and Their Importance to Utilities," if based on industry sales to date, would entitle me to not over ten seconds in front of this group, because only .8 of 1 per cent of all the room air conditioners sold during the first nine months of 1956 were equipped with heat pumps, and only 6.1 per cent of the 1.7 million room air conditioners sold by manufacturers were equipped with resistance heat. Thus, based on past performance, I should have very little to say, particularly when I consider the fact that far too many of the resistance heat units couldn't possibly supply much more warmth than a toaster, flat iron, or ski wax warmer.
>
> However, if you will permit me to extend my remarks to the future importance of the heat pump-zonal air conditioneer . . . I have a wealth of material from which to draw. . . .
>
> Gentlemen, I assure you that if you think you have, hour by hour, day by day, or month by month fluctuations in your sales of electric current, you still have a long, long way to go before you approach the wide variations that we have in our business. Accordingly, it becomes terribly imperative that we solve our problems, and in so doing I'm certain that we will solve your problems too.
>
> The way we intend to do it is to build and market a small individual heat pump that will be acceptable, desirable, efficient, and economical, and to create a market for millions of these within the next ten years. Now this is not an easy task, as I am certain you will appreciate, but the reward is so tremendous to contemplate that it's worth every ounce of physical and mental energy that we can muster.
>
> I have no intention of telling you today what this product will look like, how it will function, or what it will cost. I can assure you that there are some heretofore unaccomplished goals that now appear to be attainable in all

¶ "Undoubtedly *the electrical industry will continue to develop all manner of devices designed to use electricity for space heating, and in all probability electricity will 'move in' on a portion of the heating market now occupied by other fuels. How soon and how much would be difficult to answer at this point. Both gas and electricity have research teams working on improvement of the equipment which uses their form of energy—for both heating and cooling, as gas tries to create a summer market to offset winter peaks, and electricity tries to enlarge its winter market to offset the newly developed summer peak.*"

of these areas, but we do not wish to rush into this business pell-mell with a partial answer and an unsatisfactory product.

Some of our first zonal heating and cooling heat pump-air-conditioner designs are now being tested in homes in the United States. We have leased residential property to give us the opportunity to test these models under actual operating conditions to move ourselves as far away from the theoretical and as far into the practical realm as we can possibly go.

While this statement refers to only one company's plans for zonal units, it may be said to reflect generally the thinking of the air-conditioning industry, which is actually doing much of the pioneering and developmental work in this field for the electric power people—not on an entirely eleemosynary basis, naturally.

Mr. Augenstein said his company would aim for the "new living room" market first—the converted attic or basement room; the second step would be to aim for the new home construction market, he said; and the third and "toughest" will be "the replacement of existing flame-type heating systems with individual heat pumps."

While most room-type units will use outside air as a source of heat in winter months, larger systems may be adapted to any one of several heat sources, though not with equal facility. The earth as a heat source is widely available, but the cost of installation of ground coils is high. Further, their design is difficult, since it involves knowledge of the soil structure, and a prediction of the effects of water and vapor migration. City water, well water, and waste water all may be used as heat sources, but local costs, disposal problems, and use restrictions must be taken into consideration. Also, uncertainty as to location, temperature, and characteristics of well water often exists, and the cost of drilling is substantial. Thus it will be seen that for many installations, and certainly the smaller ones, the air offers the best and cheapest source.

As for commercial and industrial installations in new construction, first costs of equipment are said to be lower than fuel-type heating equipment. Another advantage is that the heat pump requires smaller floor areas and has a greater choice of location than other systems, due to the absence of fuel-fired equipment, fuel storage, and elimination of the need for fireproof equipment rooms and other "accessory" space.

It appears that the trend in heat pumps is toward wider use of self-contained packaged units to assure more dependable, trouble-free operation and, at the same time, a lower first cost. As the packaged heat pump becomes available in larger sizes, it is expected to replace the custom-built type of system.

However, we are getting away from our original line of discussion — the changed attitude of electric utilities toward electric space heating and their apparent embracing of the heat pump as a primary solution to their problem of load peaks and valleys.

"The future of the heat pump seems bright," to quote Thomas R. Kroeschell, an executive of the Commonwealth Edison Company in Chicago, who adds, typifying utility feeling on the subject:

The heat pump has four advantages

over any other form of heating and air conditioning. First, it has economy of installation . . . duplication of duct-work, piping, and motors is eliminated. Second, the heat pump can be compactly installed. Third, this system lends itself to flexibility of layout . . . The equipment can be located in any part of the home. . . . Fourth, the home can operate with a single utility service . . .

"The heat pump, if installed correctly," Mr. Kroeschell said, "should be as dependable as the household refrigerator."

THERE is no question of the electric power industry's desire for the winter heating business, and there is little question of its belief that the heat pump is one of the best ways to move in on it.

However, as pointed out earlier, the gas industry has a reawakened interest not only in holding its winter ascendancy but in moving into the summer business that has been created by the almost explosive development of air conditioning.

Gas utilities and equipment manufacturers have already developed and are marketing gas-powered air conditioners for summer cooling. As long as our gas resources hold out, that industry cannot be counted out of the heating picture—by conventional "flame" equipment—or out of the cooling-heating picture—by heat pumps or a combination of gas-powered refrigeration equipment in summer and flame heat in winter.

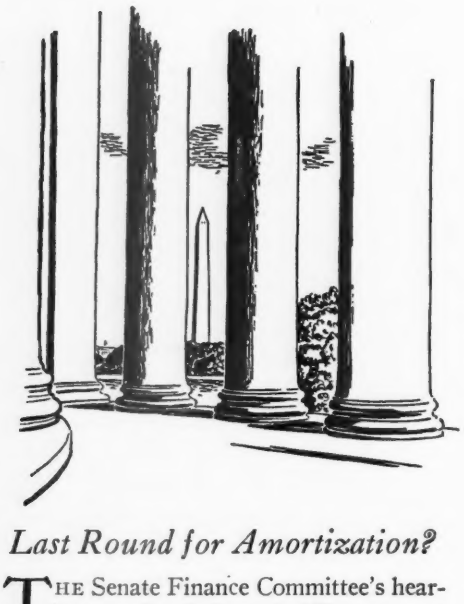
SOME of the gas industry's research is aimed at gas-powered heat pumps; theoretically there is no reason why a gas-powered air conditioner cannot have a reverse cycle, so the advent of the "heat pump era" may prove as great a boon to gas as to electricity.

At any rate, it is a new phase in the tussle for the consumer's dollar that has been going on between gas and electricity ever since a tiny filament glowed weakly in an obscure laboratory in Menlo Park.

And at the rate the year-round air-conditioning business is booming, it seems probable that both of the principals will have plenty of opportunity for growth in the next decade—on the strength of this one power-consuming application alone.

Keeping Kilowatts Out of the Egg Money

ONE of the Utah Public Service Commission's cases records that the president of a small northern Utah utility was told to keep separate accounts for his chicken-and-egg business. The commission noted that the president of the Swan Creek Electric Company was running his poultry business on company property and had utility employees take care of the chickens for him. He returned $50 of his $400-a-month salary to the company to pay for rent, help, and electricity. The agency said the side line had "not necessarily been to the financial detriment of the company and may have been of benefit . . . but good business practice requires" a separate accounting.



Washington and the Utilities

Last Round for Amortization?

THE Senate Finance Committee's hearings on its chairman's bill to put an end to the 5-year tax amortization program for industrial plants not directly concerned with defense activities proved a disappointment to the government power bloc. When the committee chairman, Senator Byrd (Democrat, Virginia), sounded off against the awarding of such a fast tax write-off certificate to the Idaho Power Company for the major part of its new plant construction on the Snake river, the advocates of a federal high dam at the Hell's Canyon site thought they had discovered an unexpected sounding board for reviving the so-called government power issue.

But while Senator Byrd was critical of the belated granting of a tax amortization certificate to the Idaho Power Company, he was not interested in turning his committee hearings over to the more or less moot question of who should be allowed to build power plants at the Hell's Canyon site. The public ownership zealots had to turn to the more sympathetic forum of the Senate Judiciary Committee, headed by Senator Kefauver (Democrat, Tennessee). Senator Kefauver's views on this question are well known and his investigation into tax amortization policies of the federal government in the electric power field is an ostensible duplication of Byrd's committee hearings without the benefit of Byrd's bill to give it authority. So, the Kefauver hearings promise to turn into a repetition of arguments which have become quite shopworn over the past three years.

BUT the never-say-die National Hells Canyon Association is playing out its cards to the last deuce. Late in April it asked the U. S. Supreme Court to reconsider its recent action in denying a review of the FPC Snake river site licenses granted to the Idaho Power Company. This is something which the U. S. Supreme Court has done only a half-dozen times in the past two decades. And since the National Hells Canyon Association had a perfect score of lost rounds in this battle (the FPC examiner; the FPC; the District of Columbia court of appeals—three judges; the District of Columbia court of appeals—nine judges; and the U. S. Supreme Court denial of certiorari) there is little reason to believe that the

highest court will now reopen the matter solely because the Office of Defense Mobilization has granted the company a rapid amortization certificate.

THE basis of the new request for reconsideration by the highest court seems to be predicated on the contention that granting the tax certificate to the Idaho Power Company changes the picture as to the relative cost of the project to the private company and to the rest of the taxpayers. But the FPC licenses were not granted on any such basis. In fact, tax benefits have not been mentioned in any of the decisions to date. It was the drawn-out litigation over the FPC licenses which ODM Director Gordon Gray gave as his reason for holding up the Idaho Power Company tax certificates so long. Otherwise, the certificate which had been applied for long ago could have been granted along with many others of a similar nature without attracting any particular attention.

There still remains, of course, the forthcoming Senate action on the bill to authorize the federal government to build a high dam at Hell's Canyon. There is the same bill which was beaten in the Senate 51 to 41 last year and there is no apparent shift of such a decisive number of votes to indicate any different result this year. In fact, the termination of litigation in favor of the company by the Supreme Court, and the steady headway being made on actual construction by the company, would seem to mitigate against the chances of favorable congressional action on this bill, aside from the virtual certainty of a presidential veto if it did get through.

Every day's construction work means that much more of a dollar-and-cents argument against Uncle Sam's tearing everything down and starting all over again on a federal high dam. Yet, Senate Majority Leader Lyndon Johnson said that he would bring the bill before the Senate for a vote before adjournment. And at the rate Congress is dawdling over a lot more important matters, this may be one of the few things that will be finally acted upon and presumably finally disposed of at this session of Congress.

Who Gets Tax Benefits?

THE controversy over the Idaho tax certificate would appear, therefore, to be a matter of belated timing, rather than the airing of an objection aimed solely at the Idaho Power Company. As ODM Director Gray's testimony before the Byrd committee indicated, the Idaho application was in good order at the time it was made. It qualified as well as numerous other applications which went through ahead of it.

Rapid tax amortization is a policy established by Congress during the Truman administration to promote expansion of defense plants and other essential industrial plants which support the national defense activity. If such a policy is ill-advised now, it was ill-advised then. And if the 5-year rapid amortization policy was ill-advised for utility companies, it could be argued that it was ill-advised for all corporate taxpayers who were allowed to take the somewhat less rapid form of accelerated depreciation for any form of business properties under the Internal Revenue Code of 1954. This is still the law and corporate taxpayers are generally taking advantage of it.

The benefits of any accelerated depreciation for tax purposes is one of deferral of tax liability rather than forgiveness or exemption of tax payments. It is true that under the 5-year amortization program certificate holders get the benefit of tax deferrals on an interest-free basis. But unless corporate tax rates change within

the depreciation period, the amount of taxes paid will eventually be the same as if there had been no rapid depreciation allowance during the earlier years of the property. The interest-free tax deferral is far less of a benefit for such taxpayers than the 27½ per cent depletion allowance on oil and gas production that represents an absolute and irretrievable deduction from tax liability for such taxpayers.

It is likely, however, that Congress will adopt Senator Byrd's bill to put an end to the amortization program except for direct defense plant building—not because the program was wrong but because it has been accomplished. ODM Director Gray admitted as much, pointing out that the program has been virtually closed down and that he could bring about the same result by administrative action, as Byrd's bill would accomplish by legislative action. But ODM would rather have some stand-by authority to act in exceptional cases. Byrd's bill would cut it off entirely.

Gas Bill Chances

HEARINGS on the Harris-O'Hara Bill to ease the burden of FPC regulation on natural gas producers have not improved the chances of early enactment of this measure. Notwithstanding a sympathetic committee, headed by the sponsor of the bill, Representative Harris (Democrat, Arkansas), the testimony of key witnesses seemed to reveal more misunderstandings and mixed signals than any unified industry and bipartisan support joined in by the administration.

In fact, Representative Harris and Speaker Rayburn appeared to have been under the impression that the original Harris-O'Hara Bill was what the administration wanted. They were accordingly dismayed when ODM Counsel Charles H. Kendall showed up with a pair of controversial amendments and made some broad hints that unless they were adopted the administration could not go along with endorsement of the bill. This was all the so-called consumer states' Congressmen needed to jump the traces and renew opposition to any legislation at all.

THE bill's supporters seem to assume that they do not have to worry about the vote in the Senate as much as in the House. ODM Counsel Kendall, who was the first administration witness before the Harris committee, said that the administration would favor slightly tighter controls over natural gas producers than those provided in the Harris-O'Hara Bill. The proposed changes by Kendall are: (1) elimination from the bill of prohibition against FPC consideration of cost in determining reasonable producer rates; (2) retention by the FPC of authority to "review price increases resulting from definite pricing clauses in existing contracts when such increases do more than reflect additional or increased taxes."

Under the proposed revision, the FPC would still be prohibited from using the traditional utility rate base cost-of-service formula for producer rates. But FPC could still consider cost, along with other standards, where applicable to a particular situation. Kendall said this change is necessary to prevent unreasonable price increases to consumers. Also, he added, interstate pipeline operators would be prevented from cutting prices below costs and thus driving fuels from the market. The second change would permit the FPC to review price increases resulting from definite pricing clauses in existing contracts (a form of FPC review which the present bill forbids) as well as increases resulting from indefinite pricing clauses.

The FPC is generally satisfied with the bill as it now stands, with a few

minor changes of a technical nature. Both the Interior Department and the Budget Bureau have given the House committee general endorsement of the legislation. There was no sign at the time that the changes suggested by Kendall would arouse much opposition. Donald C. Luce, president of the Public Service Electric & Gas Company, told the House committee that his distribution company favored passage of the bill, although it opposed passage of the Harris-Fulbright Bill last year.

THE two changes recommended by the administration have produced a sharp split among supporters of the bill. It appears now, however, that one of them—that which would permit the FPC to use cost of production in determining a reasonable price for gas—would be acceptable to producers, provided the bill clearly eliminates any mandatory requirement of the use of cost. But the administration's suggestion that the FPC should also be given authority (which the new bill eliminates) to review price increases in existing definite pricing (escalation) contracts for the sale of gas promises to cause serious difficulty.

House Speaker Rayburn has predicted that the Interstate and Foreign Commerce Committee will not approve the bill with both of these amendments. Consumer state Congressmen seem equally sure that the House will not approve the bill without such amendments. The signs now point to a committee bill, including only the cost amendment, as one having the best chance of success in the House. Gauging the over-all chances of the bill at this writing, it faces a close fight in the Interstate and Foreign Commerce Committee, no trouble in the Rules Committee, and an even chance of passing on the floor of the House, provided it can be brought to a vote before the end of June. Delay beyond that is likely to kill the bill for the session because of the annual log jam before adjournment.

Gas Rate Case Reaction

COLORADO INTERSTATE GAS COMPANY is faced with bankruptcy if the FPC hearing examiner's decision in its rate cases, announced last month, is not radically changed by the Federal Power Commission, President W. E. Mueller said recently.

The company, Mueller said, intends to press quickly its appeal to the five-man commission in order to have the decision of Examiner Samuel Binder reviewed and revised.

In his decision, Binder ordered the company to set up rate schedules which he said would amount to an increase of approximately $4.5 million over rates set by the FPC in 1952. At the same time Binder disallowed proposed rate increases totaling $20 million per year for the test year 1954. Mueller said:

> If this decision is allowed to stand, there is no question in my mind but that the company will be bankrupted and placed in receivership. I feel certain that the commission will order a revision of his decision but I also think it necessary to point out now what our situation will be if such a revision is not forthcoming.

Applying the rates authorized by Binder to the company's 1956 operations, Mueller said the company would not have earned any dividend on its common stock and also would have failed to earn any preferred dividend and also would have failed to earn a substantial portion of the interest on its bonded debt.

Telephone and Telegraph

Relocation Bills

BILLS to reimburse telephone companies and other public utilities for relocation costs incurred as a result of the federal-aid highway program have been approved in ten states, as of May 15th. Similar legislation in 16 states failed to win approval for one reason or another.

In the following nine states, new laws would require the state to pay the relocation costs in varying degrees and on the systems designated: Idaho, New Mexico, and Utah—costs on all the federal-aid systems; Montana—75 per cent of the cost on the federal-aid systems; Minnesota, North Dakota, Oklahoma, Tennessee—costs on the interstate system only; and Washington—costs on the overhead facilities on controlled-access highways in towns and cities. Georgia legislation provides reimbursement for publicly owned utilities only. The Florida legislature is reported to have passed a relocation bill which had not yet been acted upon by the governor at this writing.

Legislation that would have shifted the cost of utility relocation to the highway users has been defeated in the following 15 states: Arizona, Arkansas, Colorado, Georgia (privately owned utilities), Indiana, Iowa, Kansas, Maryland, New York, Rhode Island, South Dakota, Vermont, Washington, West Virginia, and Wyoming. The governors of Colorado, Kansas, New York, Rhode Island, and Wyoming vetoed reimbursement legislation.

A quirk in the Maine Constitution appears to have blocked reimbursement in that state. The state senate, which had been considering a bill to require the state to pay the utility relocation costs arising from construction of the interstate highway system, had asked the state supreme court for an opinion on the constitutionality of the proposed legislation. The court ruled that the expenditure of highway user revenues to relocated facilities would not be constitutional because it would violate the antidiversion amendment adopted in Maine in 1944.

ARTICLE IX of the Maine Constitution provides that all revenues derived from fees, excises, and license taxes relating to registration, operation, and use of vehicles on public highways, and to fuels used for the propulsion of such vehicles, shall be expended solely for highway purposes.

In its opinion, the court said, in part:

> We do not commonly consider that a power company in erecting a pole line or a water district in laying a pipe in

a highway is constructing a highway. To an even lesser degree would we consider the construction of a pole line or a water pipe across country to be the construction or reconstruction of a highway, although the reason for the relocation was occasioned solely by changes in the highway.

The court also pointed out that, under the common law, there is no obligation for the state to pay for removal or relocation of utility facilities when made necessary by highway construction.

Minnesota Rate Law Revised

A NEW Minnesota regulatory statute, approved last month by Governor Freeman, puts another state into the column of states using "fair value" as a regulatory standard. The Minnesota commission regulates only telephone companies and local transportation carriers. Until amended last month, the state's statutes contained a section requiring the commission to prescribe reasonable telephone rates and a separate section empowering the commission to make valuations of telephone properties.

The new statute adds an amendment to the rate section of the old one and, among other things, directs the commission to give due consideration to current values in making valuations of telephone property for the purpose of prescribing reasonable rates.

Independent Merger

A MAJOR step in the growth of General Telephone Corporation, which presently operates in 30 states, was taken last month with announcement of an agreement whereby General will acquire the Peninsular Telephone Company of Tampa, Florida, through an exchange of stock. The agreement is subject to approval by the Securities and Exchange Commission. Under the agreement, outlined in a joint announcement from both companies, Peninsular stockholders would be offered 1.3 shares of General Telephone common stock for each share of stock they exchange.

According to Donald C. Power, president of General Telephone Corporation, there is no plan to change any of Peninsular's personnel.

The acquisition of Peninsular will enable General Telephone to increase its number of telephones served from nearly 3 million to 3.3 million, after adding Peninsular's approximately 300,000 phones. Assets of General Telephone, second biggest telephone company in the United States, would be boosted from well over $900 million to more than $1 billion.

Microwave Hearings

THE proposed leasing of microwave equipment and service by common carriers has run into opposition from the Department of Justice. Hearings began May 20th before the Federal Communications Commission on proposals involving the allocation of frequencies in bands above 890 megacycles. Hearings will also be held on the Bell system's proposed tariffs for rendering microwave leased maintenance service as a utility operation.

Department of Justice hostility to both proposals was indicated in letters addressed to FCC Chairman McConnaughey by Assistant Attorney General Victor R. Hansen. On the frequency allocation issue, Hansen wrote:

> We are of the opinion that, by preferring common carrier operation of such systems, competition would be distinctly lessened and monopoly encour-

aged in the manufacture, sale, and use of the communications facilities adapted to this area of service.

We believe that § 314 of the Communications Act indicates a congressional intent to rely upon competition to regulate and develop the communications field to the greatest possible extent. Those provisions of the act regulating common carrier activities proceed upon the principle that direct regulation must be substituted for competition. This principle is inconsistent with the principle of competition, and is applicable in those areas where the common carriers already had monopolies when the Communications Act of 1934 was enacted. There is nothing in the Communications Act to indicate that any particular portion of the radio spectrum, such as the microwave region, should be turned over to the common carriers. We believe that reconciliation of the two methods of regulation requires that the common carrier concept be given as limited application as the terms of the Communications Act permit.

It is the position of the Bell system and the United States Independent Telephone Association that maximum conservation of the radio spectrum can come only through common carrier usage and that private carriers should not be given frequencies in instances in which common carriers are ready to serve.

THE Justice Department takes an equally dim view of the establishment of tariffs for telephone companies of leased maintenance of microwave equipment. In last year's antitrust suit against the Bell system and Western Electric Company, a consent decree provided that the two companies would refrain from doing any other kind of business together which was not regulated telephone business. Approval of tariffs for leased maintenance business is therefore necessary if the telephone companies are to render that kind of service as a regulated public utility. Replying to an FCC invitation for comments on the Bell system's proposed tariff filing, Hansen said:

> The AT&T judgment (consent decree in Western Electric case) generally sought to limit AT&T and its operating subsidiaries to "common carrier communications services." Accordingly, should the commission approve AT&T's proposed tariff, and should AT&T and its operating subsidiaries engage in the business of leasing and maintaining private communication systems to private users, this division would be forced to consider most seriously appropriate action under the AT&T judgment.
>
> Apart from the AT&T judgment, private communication is a young and growing field. It provides a vital service in our complex society. Therefore, there is a major public interest in assuring the adequacy and efficiency of this service. Vigorous and healthy competition is essential to a growing and expanding industry. Approval of the proposed "tariff" by the commission might substantially lessen the competition which now exists in the leasing, as well as in the manufacture and sale, of equipment for use in private communication systems. Acceptance by the commission of the AT&T tariff might well extend the Bell system in this industry at the expense of its many private competitors. Accordingly, the commission's action on this pending tariff application is of vital interest to the antitrust division.

Financial News and Comment

By OWEN ELY

High Lights of Electric Utility Reports to Stockholders

In connection with the Edison Electric Institute convention, our annual review of the reports to stockholders is presented. Unfortunately, it is impossible to cover all reports and undoubtedly many interesting points have been overlooked in attempting to compress the story into the space available.

Format. Arizona Public Service Company again published its unusual tabloid form of report measuring about 14 inches by 11 inches. It is "folksy" in presentation, with colored pictures and charts interspersed with text and tables. The full-page statistical table "For the Financial Analysts" is appreciated.

Charts are used by all utilities, but a few reports are outstanding. Duke Power's new format has an attractive presentation of charts, tables, maps, and pictures, using large type for easy reading. New England Gas & Electric has a large two-page chart covering thirty years of growth, divided into such periods as Rapid Growing Up (1927-30), The Great Depression (1931-39), World War II (1940-45), the Postwar Boom (1946-48), the Korean War (1951-53), etc. Idaho Power's report is also outstanding with respect to charts. Interstate Power's "Inside News of the Year," with a photostat of a large number of news clippings relating to company developments, is interesting; Iowa Southern uses the same idea.

Department Index

Area Development. The reports of the Florida utilities expatiate enthusiastically on the rapid growth of that state. Florida P&L's report states:

> Tourists continue to flock to the state in greater numbers than ever before! Agricultural income jumped to a new high! But the spotlight of greatest national interest was focused on the stepped-up rate of industrial expansion which saw some 400 new manufacturing plants and major expansion projects taking root all over Florida, giving added impetus to the rapid rate of population growth.

Florida Power Corporation's inside cover contains 14 growth charts, showing gains of 366 per cent in revenues, 751 per cent in taxes, 123 per cent in share earnings, 83 per cent in common dividends, etc.

Long Island Lighting's rapid growth is indicated by the fact that ten years ago its new Barrett station could have taken care of the entire load, but today accounts for only one-fifth of capacity. Savannah Electric & Power describes the remarkable growth occurring in postwar Georgia, which led the entire Southeast and was fourth in the nation in the number of large new industrial plants—many of them in the Savannah area.

The reports of Kansas G&E, Oklahoma G&E, and Virginia E&P describe the transition from a farm to an industrial economy, which is occurring in their respective states.

In the New England area Public Service of New Hampshire points out that its state is one of the ten most highly industrial in the nation, with a shift from dependence on textiles and shoes to durable goods. Central Maine Power reports that production in almost all classes of industry equaled or exceeded the previous year. Pulp and paper expanded capacity and are planning further growth. Shipbuilding and allied enterprises benefited by new defense contracts. The shoe and leather industry, now the largest employer of labor in the state, continued to grow.

Boston Edison's report contains a chart showing that the textile business contributed only 6 per cent of total industrial revenues in 1956, ranking sixth among the large industrial groups. Electronics has been the most rapidly growing, and now contributes twice as much revenues as textiles; scientific instruments are also important.

Weather is somewhat less important as a topic this year. While the eastern seaboard was free from major hurricanes of the West Indies type in 1956, local storms and floods continued to harass some individual companies. Connecticut Light & Power has been particularly unfortunate, having had unusually severe storms in each of the past four years—two hurricanes in 1954, ice storms in 1953 and 1956, and two floods in 1955. However, the company does not accrue any reserve for storm damages since none of these disasters has affected more than a small proportion of the widespread property. Long Island Lighting, following its experience with the 1954 hurricanes, has been accruing a reserve. Florida P&L also does so. Utilities in the big western drought area are of course interested in irrigation projects and other means of coping with declining water supplies. Central Power & Light (in Texas) reports that the Wesley Seale dam (completed this year) will assure an ample water supply for the Corpus Christi area.

Hydro Projects. California-Oregon Power's report describes graphically several big hydro projects on pages 10, 11 of its report—the 186,000-kilowatt North Umpqua river development, completed late last year after a decade's work, the 315,000-kilowatt Klamath river development begun last year, and the 281,000-kilowatt McCloud river development plan for the future. Alabama Power, subsidiary of Southern Company, hopes to get its huge Coosa and Warrior river projects under way as soon as licenses are received from the FPC. Ultimate capacity will be 627,000 kilowatts compared with the company's present hydro capacity of 490,000 kilowatts. British Columbia Power describes its 557,000-kilowatt construction program (mostly hydro) to be completed by 1960; the Cheakamus development, the world's biggest remotely controlled hydro station, goes on the line this year. The Trinity river project in California was authorized by Congress in 1955 as an addition to the older Central Valley

project, to store and divert waters from the Trinity river to the Sacramento river basin for irrigation. Pacific G&E has offered to install hydro plants with a capacity of 384,000 kilowatts, saving the federal government about $56 million in construction costs and providing local tax revenues of $145 million. This project seems an excellent example of the "partnership policy."

Idaho Power's report, with a two-page map of the Northwest, shows a number of present and scheduled power plants and discusses the three hydro plants which have aroused so much controversy in Congress. There are many examples of the "partnership policy" in the Pacific Northwest. Thus Pacific Power & Light is building a 189,000-kilowatt dam on the Lewis river for its own use, but the water will be used again at a lower level by Cowlitz County PUD No. 1 which will sell the power to the company. The company is co-operating with PUD No. 2 of Grant county which is building Priest Rapids dam, and expects to take about one-seventh of the output or about 88,000 kilowatts. (Public and private utilities are interested.)

WASHINGTON WATER POWER reports that its 400,000-kilowatt Noxon Rapids plant is one-quarter completed. It also describes the Priest Rapids project, scheduled for completion in 1961, and the adjacent Wanapum project to be completed in 1963. Congress was unwilling last year to enact a bill for the partnership construction of the $310 million John Day project on the Columbia river. Along with other local interests the company had offered to finance 88 per cent of the cost of the project, with the remainder to be borne by the federal government and allocated to flood control and navigation.

The year 1956 was the first full year of operation under the agreement with Public Utility District No. 1 of Chelan county. Due to very favorable water conditions output was considerably above normal and cost of power less than anticipated. The company received about 89 per cent of the energy (the remainder being used in the local service area). The plant was purchased from the PUD by the company in 1955. In Stevens county where voters in 1955 elected to have service provided by the company rather than a PUD, a survey of customer opinion last year showed that 82 per cent felt favorably about rates and 87 per cent were satisfied with the service.

The National Hells Canyon Association has opposed the efforts of the Pacific Northwest Power Company (owned by four private utilities) to obtain an FPC license for the proposed 1.2 million-kilowatt Mountain Sheep-Pleasant Valley project on the Snake river. Voluminous testimony from farm, business, industry, labor, and other local groups was presented in favor of the proposed development at FPC hearings held locally. Due to this opposition granting of a license was delayed, but the FPC is expected to rule early this summer.

Puget Sound P&L describes its ambitious program for developing 178,000 kilowatts new hydro capacity on the Baker and Snoqualmie rivers. The Utilities Council of the Cascade region, of which Puget Sound is a member, is investigating projects totaling 2.8 million kilowatts capacity, of which 1.2 million have already been licensed.

POWER AT NIAGARA. The reports of Niagara Mohawk Power, Rochester G&E, and New York State E&G discuss the vicissitudes of the Niagara river project. The Rochester report describes the difference between the Clark-Buckley

bills (favored by the government power group) and the Ives-Javits-Miller bills. The former bills contain a full-fledged preference clause, while the latter seek to promote a "more equitable distribution" of Niagara power to all domestic and rural customers within the Niagara economic market area. Following is the tentative allocation of power by the New York State Power Authority:

	Kilowatts
Niagara Mohawk	445,000
New Defense Plants	300,000
Expansion of Existing Industries	250,000
Ohio and Pennsylvania	150,000
Niagara Mohawk, NYSE&G, and Rochester G&E, for Rural and Domestic Consumers	730,000
Municipalities, Co-ops, Etc. within Economic Distance, Which Can Use and Pay for Power	125,000
Total	2,000,000

There have been some fears that municipalities and other government power agencies would gain too big a foothold if the Niagara bills containing the preference clause are passed. However, Niagara Mohawk's report states that the citizens of Ogdensburg, near the St. Lawrence development, defeated a proposal to set up a municipal plant by 61-39 per cent last summer. In Dunkirk, one of the oldest municipal operations, voters in February approved sale of the municipal plant to the company. These developments indicate that the trend seems to be away from municipal ownership.

Cleveland Electric's report refers to the preference clause as "a legalistic device which discriminates against the four-fifths of American taxpayers who are customers of business-managed power companies." Cincinnati G&E reports that opinion surveys show that among those who know of the preference discrimination, nine out of ten served by investor-owned companies, and seven out of ten of those benefiting from the discrimination, are opposed to the working of the preference clause.

Atomic Energy. The great majority of the reports to stockholders refer to their continuing interest in atomic reactors, despite current difficulties with pending legislation at Washington. New England is especially interested because of its lack of nearby oil and coal supplies and the constant increases in the cost of bringing fuel into the area. Western Massachusetts Companies pictures the proposed Yankee plant, and shows on a map the eleven utilities (serving 90 per cent of New England) which sponsor the enterprise. Only preliminary work has been done so far, but active construction may begin this year. The cost of electricity from the new plant will be higher than the present cost at the West Springfield heating plant, but because the cost of fossil fuels is trending upward, the company thinks the new venture is fully warranted.

Duquesne Light's report describes the 60,000-kilowatt Shippingport atomic power station which is expected to begin operating late this year—the world's first full-scale atomic power plant devoted primarily to power. (England's plant is partly military.) Consolidated Edison describes the changes in design in its big plant, on which preliminary work began last December. Capacity has been increased from 236,000 kilowatts to 275,000 and the cost has jumped from $55 million to $70 million. Two pages are devoted to a large picture and story about the reactor.

The Enrico Fermi plant at Lagoona Beach on the southern border of Michigan, sponsored by Detroit Edison and a large affiliated group, has been delayed because of labor union contentions that safety measures are inadequate. Founda-

tion work for the building is reported well under way. Three Florida utilities have formed the Florida Nuclear Power Group which also includes three engineering companies. No definite building plans have yet been developed, since the type of reactor has not yet been determined.

Natural gas is gradually penetrating to all areas. The Upper Peninsula of Michigan (almost a separate country) is one of the few remaining sections in which natural gas service is not available. However, Midwestern Gas Transmission, affiliate of Tennessee Gas, may serve part of this area if the company receives an FPC certificate. Northwestern Public Service celebrated the introduction of gas to its area in South Dakota after eighteen years of hard work.

Cheap natural gas as boiler fuel has contributed greatly to the prosperity of southern electric utilities, but until recently Florida companies have been forced to use oil, except in the north. Florida Power Corporation has now signed contracts with Sun Oil and Pure Oil for 50 million cubic feet a day. It has contracted with Houston-Texas Gas & Oil to transport the gas, and, if the FPC approves construction of the pipeline, the company's five plants in central and west coast Florida will begin using gas some time next year. Florida P&L will also benefit. Fuel savings of about 15 per cent will be passed along to customers under fuel adjustment clauses.

RESIDENTIAL HEATING. Despite competition from natural gas—newly introduced into the Pacific Northwest—it is interesting to note that Washington Water Power has decided to promote electric space-heating actively. (There are already over 7,000 electrically heated homes in the company's area.) The point was made in the company's report that a home equipped for electric heating will have adequate wiring capacity for other major appliances, including those to be developed in future. Regarding natural gas, the report states: "The vast majority of our customers have preferred to retain the low-cost, safety, convenience, and many other advantages of all-electric living."

Florida Power Corporation (which has pioneered in developing the heat pump) states that Florida now has more heat pumps installed than all the rest of the U. S. "These impressive figures reveal that our intense promotional efforts have really paid dividends. The heat pump is not only a welcome convenience for our customers, but is an excellent load factor."

Sales Activities. Many reports refer to the "House-Power" and "Better Electric Living" campaigns. Northern States Power reports that over 240,000 major electric appliances were added to its lines in 1956. The company demonstrated the new electronic range throughout its area.

SALES GROWTH. Delaware P&L has joined the ranks of the so-called growth utilities, and expects to gain impetus from its new big Delaware City generating station, completed last December, which will supply Tidewater Oil's new refinery with steam and electricity. The company has a uniquely favorable contract with Tidewater—it will be reimbursed for all operating expenses and taxes and will receive an adequate return on its investment; Tidewater will have an option to buy the plant.

American G&E's report has a golden touch—celebrating fifty years of progress. A chart shows the company's accelerating growth during the past two decades—present sales are nearly three times those of a decade ago. With a rapid influx of new industries into the company's area (including large aluminum plants) dynamic growth should continue.

Atlantic City Electric's annual report features "Growth through Planning" under various subheads, such as Construction, Agricultural, Commercial, Industrial Sales, and Personnel. The area has been growing much faster than the U. S. average, and further benefits are expected from new bridges, parkways, etc.

The report of Missouri Public Service, historically operated by several generations of the Green family, shows that its $12 million revenues are over six times as large as twelve years ago; the company is benefiting by suburban developments around Kansas City. Public Service of New Mexico points out that its average annual load increase has exceeded 12 per cent over the past five years *versus* 8 per cent for the U. S. Rockland Light & Power of New York, due to the opening of new bridges and express highways, has been drawing new industries into its area with accelerated growth. Many other instances of growth could be mentioned.

ELECTRONIC COMPUTERS. The electric utilities have in the past obtained substantial economies by partially mechanizing their accounting and billing work. Now added economies are being obtained by the use of electronic computers. American G&E, for example, made its first installation late last year, and by the end of 1958 expects to handle all customer accounting by computers, with significant gains in economy and efficiency. Digital computers are also being used for engineering problems and as network analyzers. New England Gas & Electric, with other gas companies in New England, is buying an electronic network analyzer for use at Tufts College.

Ohio Edison recently put GEDA, an electronic brain, through its paces at Massillon, the nerve center of system operations. This new type of computer is expected to permit substantial fuel savings and its performance is being closely followed by other utilities. It makes rapid-fire calculations of the costs of generating electricity at various units, based on a wide range of fixed and variable factors, putting the conclusions into effect automatically. The big new power pool known as the Pennsylvania-New Jersey-Maryland interconnection (described in Philadelphia Electric's report) will use electronic instruments to schedule operations around the clock so as to obtain the lowest cost of power among eight companies' generators.

RATES AND REGULATION. Rate proceedings are becoming more important, a number of new applications having been filed this year because of rising costs. Niagara Mohawk Power increased its rates by $5.8 million for 25 large industrial customers at Niagara Falls, following the loss of the major part of the Schoellkopf station last June. It has now filed other increases with the New York commission. It is estimated that all the requested increases, if allowed, might approximate 50 cents a share on the common stock.

Public Service of Indiana notes in its report that, following a court appeal, the Indiana commission established a "fair value" rate base, excluding properties under construction, and found 5.7 per cent to be a fair return. Pacific G&E last December requested an increase in natural gas rates for interruptible industrial use, in order to offset higher costs of fuel oil and natural gas; and in February the company asked the commission to increase electric rates (with some exceptions) by about 6 per cent and also requested an equitable automatic fuel adjustment clause. While the amount of the total rate increase application was not reported, 6 per cent of total electric revenues would be in the neighborhood of $18 million.

Southern California Edison's earnings are also in a downtrend due to higher fuel costs. In 1954 the company obtained a rate increase designed to yield a 5.9 per cent return. Now it is asking for a $34 million increase which might yield initially 6.7 per cent, and should average 6.4 per cent over a reasonable period. While the earlier case took twenty-one months, it is thought that present proceedings may take less than a year and that some decision may be forthcoming this summer or fall.

MIDDLE SOUTH UTILITIES' report describes the trend of rate regulation in the state of Arkansas. While the subsidiary, Arkansas P&L, had two unsuccessful rate applications earlier, some relief was finally granted last year and a detailed cost-of-service study has probably now been completed. With the earned rate of return still only slightly above 5 per cent, some further adjustment seems possible.

New England Electric System is asking for $2.8 million rate increase in Rhode Island for its subsidiary, Narragansett Electric Company. In Pennsylvania where the regulatory trend has been somewhat adverse under a Democratic governor, Pennsylvania Power & Light finally accepted the commission's orders to reduce rates by $1.4 million and to refund about $9.3 million to customers. Cincinnati G&E in its new electric rate ordinance, which became effective last July for four years, retained automatic adjustments for changes in the cost of coal for practically all rates, but adjustments for changes in taxes and cost of labor were dropped.

RECENT FINANCIAL DATA ON GAS UTILITY STOCKS

Annual Rev. (Mill.)			*5/8/57 Price About*	*Dividend Rate*	*Approx. Yield*	*Recent Share Earns.*	*% Increase*	*Aver. Incr. In Sh. Earns. 1951-56*	*Price-Earns. Ratio*	*Div. Payout*	*Approx. Common Stock Equity*
		Pipelines									
$ 4	O	Ala.-Tenn. Nat. Gas	20	$1.20	6.0%	$1.36Ma	D4%	14%	14.7	89%	40%
16	O	Commonwealth N. G. ...	34	1.60	4.7	2.77De	6	X	12.3	58	39
17	O	E. Tenn. Nat. Gas	9	.60	6.7	.83De	30	X	10.8	72	19
71	S	Miss. River Fuel	36	1.60	4.6	2.33De	16	8	15.4	69	50
80	S	Southern Nat. Gas	43	2.00	4.7	2.35De	D1	4	18.3	85	46
268	O	Tenn. Gas Trans.	35	1.40	4.0	1.93De	9	18	18.1	73	20
175	O	Texas East. Trans.	26	1.40	5.4	1.88Ma	D20	3	13.8	74	24
71	O	Texas Gas Trans.	23	1.00	4.3	2.10Ma	9	4	10.9	48	27
88	O	Transcont. Gas P. L. ...	20	1.00	5.0	1.43Ma	18	19	14.0	70	19
		Averages			5.0%				14.3	71%	
		Integrated Companies									
158	S	American Nat. Gas	60	$2.60	4.3%	$3.90Ma	D3%	13%	15.4	67%	35%
50	A	Arkansas-Louis. Gas ...	24	1.20j	5.0	1.50Oc	NC	10	16.0	80	53
47	O	Colo. Interstate Gas	76	1.25	1.7	5.09De	D3	36	16.4	25	35
343	S	Columbia Gas System ..	17	1.00	5.9	1.41Ma	D2	7	12.1	71	43
8	O	Commonwealth Gas	7	.10	1.4	.26#	D51	D	—	38	72
12	S	Consol. Gas Util.	16	.90	5.6	1.39Ja	15	—	11.5	65	61
266	S	Consol. Nat. Gas	44	1.90	4.3	3.33De	16	4	13.2	57	67
186	S	El Paso Nat. Gas	36	1.30	3.6	2.11De	9	7	17.1	62	24
44	S	Equitable Gas	33	1.60	4.8	2.28Ma	10	4	14.5	70	36
17	O	Kansas-Nebr. Nat. Gas ..	37	1.65	4.5	2.44De	2	3	15.2	68	30
95	S	Lone Star Gas	36	1.80	5.0	2.22Ma	D9	5	16.2	81	48
25	S	Montana-Dakota Util. ..	25	1.00	4.0	1.42Ma	D4	19	17.6	70	32
23	O	Mountain Fuel Supply ..	25	1.20	4.8	1.66De	10	9	15.1	72	57
81	S	National Fuel Gas	19	1.10	5.8	1.68Ma	—	8	11.3	65	62
113	S	Northern Nat. Gas	58	2.60	4.5	3.60De	13	7	16.1	72	37

43	S	Oklahoma Nat. Gas	28	1.50	5.4	2.05Ma	D9	6	13.7	73	29
113	S	Panhandle E. P. L.	55	1.80	3.3	2.75De	10	16	20.0	65	35
11	O	Pennsylvania Gas	25	1.20	4.8	1.63#	D10	D	15.3	74	68
166	S	Peoples G. L. & Coke ...	48	2.00	4.2	2.93Ma	D9	7	16.4	68	42
34	O	Southern Union Gas	29	1.12	3.8	1.52De	D10	9	19.1	74	35
273	S	United Gas Corp.	38	1.50	3.9	2.43Ma	17	7	15.6	62	43
		Averages			4.3%				15.4	65%	
		Retail Distributors									
28	A	Alabama Gas	30	$1.60	5.3%	$2.36De	8%	31%	12.7	68%	42%
44	O	Atlantic Gas Light	31	1.60	5.2	2.67De	32	11	11.6	60	36
5	O	Berkshire Gas	15	.90	6.0	1.52F	22	46	9.9	59	35
6	O	Bridgeport Gas	28	1.60	5.7	2.54De	17	48**	11.0	63	43
4	O	Brockton-Taunton Gas ..	16	.90	5.6	1.29De	32	60	12.4	70	40
59	S	Brooklyn Union Gas	36	2.00	5.6	2.79Ma	D3	6	12.9	72	49
1	O	Cascade Nat. Gas	9½	—	—	Def.De	—	—	—	—	13
33	O	Central El. & Gas	17	.90	5.3	1.67Se	28	9	10.2	54	17
12	O	Central Indiana Gas	13	.80	6.1	1.06Ma	10	4	12.3	75	65
5	O	Chattanooga Gas	5	.30	6.0	.38F	D11	14	13.2	80	45
64	O	Gas Service	24	1.36	5.7	1.92De	4	0	12.5	71	40
7	O	Hartford Gas	37	2.00	5.4	3.01De	39	5	12.3	66	48
2	O	Haverhill Gas	21	1.32	6.3	2.05F	37	2	10.2	64	58
31	O	Houston Nat. Gas	34	1.50	4.4	2.26Jy	24	6	15.0	66	22
17	O	Indiana G. & Water	20	1.00(k)	5.0	1.51Ma	D4	9	13.2	66	45
45	S	Laclede Gas	15	.80	5.3	1.09De	4	7	13.8	73	35
4	O	Michigan Gas Utils.	22	1.05	4.8	1.36Ma	D8	14	16.2	77	38
4	O	Midsouth Gas	14	.60	4.3	.72#	71	D	19.4	83	34
42	O	Minneapolis Gas	26	1.40	5.4	1.99De	22	14	13.1	70	38
15	O	Miss. Valley Gas	18	1.12	6.2	1.31Ma	D30	5	13.8	85	30
4	O	Mobile Gas Service	22	1.00	4.5	1.17De	D13	D	18.8	85	33
7	O	New Haven Gas	29	1.70	5.9	2.26De	D6	10	12.8	75	66
12	O	New Jersey Nat. Gas ...	27	1.20(i)	4.4	2.23De	17	—	12.1	54	32
80	O	No. Illinois Gas	18	.88	4.9	1.34Ma	D2	—	13.4	66	54
8	O	North Penn Gas	13	1.00	7.7	1.02De	23	7	12.7	98	56
6	O	North Shore Gas	15	.80	5.3	1.16De	23	6	12.9	69	54
224	S	Pacific Lighting	37	2.00	5.4	2.54Ma	D11	14	14.6	78	39
19	O	Pioneer Nat. Gas	29	1.32	4.6	2.02De	15	17	14.4	65	39
13	O	Portland Gas & Coke ..	37	1.00	2.7	2.57Ma	16	8	14.4	39	36
2	O	Portland Gas Light	10	.75	7.5	.73De	D40	—	13.7	103	25
8	A	Providence Gas	9½	.56	5.9	.63De	6	15	15.1	89	60
3	A	Rio Grande Valley Gas ..	3	.15	5.0	.28De	7	9	10.7	54	58
3	O	So. Atlantic Gas	13	.80	6.1	.89#	12	D	14.6	90	35
11	O	South Jersey Gas	27	1.40	5.2	2.12De	25	28	12.7	66	55
26	S	United Gas Impr.	37	2.00	5.4	2.45Ma	5	1	15.1	82	64
48	S	Wash. Gas Light	38	2.00	5.3	3.13Ma	D3	4	12.1	64	43
8	O	Wash. Nat. Gas	15	.10(l)	0.7	.34Se	D33	—	—	117	67
7	O	Western Ky. Gas	13	.60	4.6	.87Ma	D31	20	14.9	69	38
		Averages			5.3%				13.4	72%	

RECENT FINANCIAL DATA ON TELEPHONE, TRANSIT, AND WATER STOCKS

Annual Rev. (Mill.)			*5/8/57 Price About*	*Dividend Rate*	*Approx. Yield*	*Recent Share Earns.*	*% Increase*	*Aver. Incr. In Sh. Earns. 1951-56*	*Price-Earns. Ratio*	*Div. Payout*	*Approx. Common Stock Equity*
		Communications Companies									
		Bell System									
$5,825	S	Amer. T. & T. (Cons.) ..	178	$9.00	5.1%	$13.18*F	—	2%	13.5	68%	67%
274	A	Bell Tel. of Canada	45	2.00	4.4	2.25De	D3%	2	20.0	89	64
43	O	Cin. & Sub. Bell Tel. ..	87	4.50	5.2	5.58De	2	4	15.6	81	100
209	A	Mountain Sts. T. & T. ..	126	6.60	5.2	9.17F	15	13	13.7	72	68
308	A	New England T. & T.	136	8.00	5.9	8.31Ma	D6	4	16.4	96	60
792	S	Pacific T. & T.	129	7.00	5.4	8.79F	—	4	14.7	80	58
98	O	So. New Eng. Tel.	38	2.00	5.3	2.19De	13	3	17.4	91	59
		Averages			5.2%				15.9	82%	

		Independents									
5	O	Anglo-Canadian Tel. ...	35	$ .60	1.7%	$3.19Ma	11%	54%	11.0	19%	44%
33	O	British Col. Tel.	45	2.00	4.4	3.32Se	6	22	13.6	60	28
2	O	Calif. Inter. Tel.	11	.70	6.4	.80De	D20	—	13.8	88	30
15	O	Calif. Water & Tel.	20	1.20	6.0	1.52De	4	10	13.2	79	42
14	O	Central Telephone	23	1.00m	4.3	2.15Se	13	14	10.7	47	25
3	O	Commonwealth Tel.	14½	.80	5.5	1.31#	27	26	11.1	61	32
4	O	Florida Telephone	20	.90	4.5	.86De	D2	D	23.3	105	42
237	S	General Telephone	44	1.80	4.1	3.05De	17	32	14.4	59	37
15	O	Hawaiian Telephone	18	1.00	5.6	1.29Ma	D11	19	14.0	78	42
6	O	Inter-Mountain Tel.	14	.80	5.7	.80De	D16	2	17.5	100	62
22	S	Peninsular Tel.	55	2.00	3.6	2.35Ma	D2	2	23.4	85	46
21	O	Rochester Tel.	18	1.00	5.6	1.62De	6	6	11.1	62	39
3	O	Southeastern Tel.	17	.90	5.3	1.36Se	43	13	12.5	66	42
9	O	Southwestern St. Tel. ..	20	1.12	5.6	1.58De	16	4	12.7	71	40
31	O	United Utilities	21	1.20	5.7	1.63De	D5	5	12.9	74	36
13	O	West Coast Tel.	18	1.00	5.6	1.30De	D5	18	13.8	77	41
252	S	Western Union Tel.	19	1.00	5.3	2.21De	5	15	8.6	45	86
		Averages			5.0%				14.0	69%	
		Transit Companies									
19	O	Baltimore Transit	11	—	—	$ .18De	D86%	X	—	—	28%
13	O	Cincinnati Transit	4	$ .30	7.5%	.48De	41	10%	8.3	63%	46
8	O	Dallas Transit	5	.35	7.0	.90De	58	0	5.6	39	54
33	S	Fifth Ave. Coach Lines ..	27	2.50	9.3	3.47De	21	4	7.8	73	63
244	S	Greyhound Corp.	17	1.00	5.9	1.27De	8	—	13.4	79	52
23	O	Los Angeles Transit	18	1.40	7.8	1.23De	30	11	14.6	114	92
26	S	Nat. City Lines	24	2.00	8.3	2.45De	D10	11	9.8	82	94
13	O	Niagara Frontier Trans.	8½	.60	7.1	.28De	D81	—	—	214	82
69	O	Phila. Transit	9	.60	6.7	1.67De	31	8	5.4	36	38
6	O	Rochester Transit	5	.40	8.0	.68De	58	18	7.4	59	41
23	O	St. Louis P. S.	11	1.40	12.7	.69De	1	19	15.9	203	97
15	S	Twin City R. T.	17	1.80	10.6	1.21De	1	D	14.0	149	48
22	O	United Transit	5	.60	12.0	.88De	D15	21	5.7	68	48
		Averages			8.6%				9.8	98%	
		Water Companies									
		Holding Companies									
40	S	American Water Works .	10	$ .60	6.0%	1.00Ja	2%	6%	10.0	60%	16%
		Operating Companies									
5	O	Bridgeport Hydraulic ...	30	$1.60	5.3%	$2.10De	2%	4%	14.3	76%	58%
13	O	Calif. Water Service	41	2.20	5.4	3.19Ma	12	3	12.9	69	32
4	O	Elizabethtown Water ...	37	1.60	4.3	3.28De	16	31	11.3	49	56
9	S	Hackensack Water	40	2.00	5.0	2.87De	D20	2	13.9	70	37
8	O	Indianapolis Water	18	1.00	5.6	1.42De	D12	17	12.7	70	34
5	O	Jamaica Water	34	2.00	5.9	2.88Ma (N)	2	8	11.8	69	25
4	O	New Haven Water	57	3.00	5.3	2.88De	D13	—	19.8	104	58
2	O	Ohio Water Service	26	1.50	5.8	2.35Ma	D5	7	11.1	64	36
8	O	Phila. & Sub. Water	30	.50(e)	1.7	3.08Ma	36	3	9.7	16	28
2	O	Plainfield Un. Water ...	62	3.00	4.8	5.47#	37	8	11.3	55	40
4	O	San Jose Water	45	2.80	6.2	3.59Ma	7	9	12.5	78	45
10	O	Scranton-Springbrook ...	17	.90	5.3	1.42De	3	8	12.0	63	29
5	O	Southern Calif. Water ..	14	.80	5.7	1.19Ma	13	8	11.8	67	34
4	O	West Va. Water Service .	20	1.40	7.0	1.67Ma	7	—	12.0	84	17
		Averages			5.2%				12.7	67%	

A—American Stock Exchange. O—Over-counter or out-of-town exchange. S—New York Stock Exchange. #—Year ended December, 1955. Ja—January; F—February; Ma—March; Ap—April; My—May; Je—June; Ju—July; Au—August; Se—September; Oc—October; N—November; De—December. (e)—Also paid 5 per cent stock dividend December 1, 1956. (i)—Paid 2 per cent stock dividend December 10, 1956. (j)—Paid 10 per cent stock dividend November 21, 1956. (k)—Paid 3 per cent stock dividend December 19, 1956. (l)—One share of Pacific Northwest Pipeline for 70 shares held. (m)—Paid 10 per cent stock dividend January 2, 1957. (N)—Adjusted to eliminate 66 cents per share of nonrecurring tax savings. NC—Not comparable. NA—Not available. X—Deficit in 1951. *On average shares. **1951 was an abnormally bad year.

What Others Think

America's Energy Needs

A DISCUSSION of America's energy requirement, both present and future, was one of the high lights of the forty-fifth annual meeting of the Chamber of Commerce of the United States, held in Washington, D. C., late in April. Speakers at a luncheon meeting devoted to the problem of meeting the nation's energy needs included Harllee Branch, Jr., president of The Southern Company, and F. K. McCune, vice president and general manager, atomic products division, of the General Electric Company.

Both speakers found the theme of the chamber's annual meeting—"Unleashing the Creative Energies of People"—particularly appropriate to the activities of their industry. ". . . it is not amiss to point out," said Branch, "that America's industrial leadership and unmatched standard of living did not result merely from an abundance of fossil fuels in their natural state—for such fuels exist in many lands—but from the more energetic and effective discovery, extraction, and utilization of them. In other words, we have produced and prospered in America not because of any real or imaginary advantages of territory, soil, or climate alone—and not even because of any monopoly of brains or scientific knowledge—but primarily because of the character of our people and the institutions under which we live."

Today the United States, with only 6 per cent of the world's population, uses 41 per cent of its electric power, Branch pointed out. In the ten years between 1947 and the end of 1956, the production of electricity in this country increased from 223 billion kilowatt-hours to 601 billion, and generating capability increased from 50 million kilowatts to over 126 million. By 1966, it is estimated that this capacity will be increased to 236 million kilowatts, and by that time it is expected that the U. S. electric industry will be producing 1¼ trillion kilowatt-hours a year. Branch said:

> A state program of energy development is sometimes supposed to have attributes of efficiency not attainable under a system of individual enterprise. The theory is that the authoritarian state need not spare expense or too greatly ponder risks. The state is supposed by some to be able to move speedily into whatever technological byways it deems appropriate for whatever programs it wishes to launch at a particular moment. It is interesting, therefore, to note that in comparison with the rest of the world America is by far the biggest producer and consumer of electric power in the world. Russia, its nearest competitor, has barely one-fourth the capacity of the United States.

Lest someone say we started earlier, I would point out that in the past five years alone America's investor-owned electric companies have installed new capacity equal to the *total* present installed capacity of Russia. We have more electric capacity than the next seven countries combined.

BRANCH called this a tribute to the creative energy of the American people, noting that nearly four million Americans are the direct owners of the securities of the nation's electric power companies, and three out of every five Americans are indirect owners through their insurance investments. The electric industry, he said, is the most publicly owned enterprise in America.

Nuclear power, Branch continued, is already an integral part of the everyday activities of the electric power companies. Despite high cost of generating electricity with nuclear fuels, plus the fact that the United States has no such immediate need for nuclear power as some other nations, Branch noted that some 69 electric companies and associated organizations are presently engaged in the development of 14 nuclear reactor projects. It is expected that these projects will have an electric capacity of 1.5 million kilowatts. Over 400 million free enterprise dollars, he added, have been contributed by American investors to finance these projects since the time—only two and one-half years ago—when private electric companies were first permitted to engage in nuclear power activities.

In explaining the electric power industry's attitude toward reactor development, Branch said:

> It is the opinion of the electric companies that commercial utilization of nuclear power can be achieved best and earliest through development and construction at this time of a variety of different reactor types since it is not possible at this early stage to determine which reactor type or types ultimately will prove most advantageous for commercial use. Therefore, the industry's present broad program entails development of a number of different basic reactor types, plus variations and improvements of certain of those types.

BRANCH agrees that the electric industry should pursue an aggressive course in nuclear power development, but rejects any program that would tend to socialize the atom. He warned:

> We ought not to forget that technological processes and machines . . . cannot unleash the *creative* energies of our people if in their development and use, we destroy the very climate of political freedom which is so indispensable to creative endeavor. Mechanical energy under government monopoly can become a vehicle of tyranny and discrimination— degrading and demoralizing to the citizen and destructive of his freedom as well as his investments. In this day when so many are clamoring for governmental "crash" programs in the fields of electrical and atomic power, we need to remember that some things are more important than speed. The man who loses his life in a speeding ambulance, or finds himself ensnared in the underbush of an uncertain short cut while rushing to avail himself of a new and marvelous panacea, can be duplicated by a nation which surrenders caution and departs from proven paths of political and economic experience in quest of a technological millenium.

WITH respect to future power requirements, F. K. McCune told the chamber luncheon that energy from nu-

clear fission—in which large heavy atomic nucleii are broken down into smaller atoms, with the release of huge quantities of energy from part of the original mass —will be needed in the United States in the 1970's and 1980's to supplement energy obtained from our conventional fuels. "Substantial amounts of electricity from atomic energy," said McCune, "are scheduled to come on the line during 1960 and 1961. Everyone is confident that the development of these plants and others which will come along rapidly will allow us to see clearly the time of real economic power in this country."

ALTHOUGH we have in the United States, McCune continued, supplies of economically recoverable coal which will be adequate for several centuries, it is interesting to speculate on how far into the future we may count on supplies of nuclear fuels, thorium and uranium, for the fission process. He said:

> One very rough estimate indicates the apparent world reserves of these source materials represent a heat content more than 25 times the economically recoverable world reserves of coal. This will obviously be adequate for many, many centuries for the type of energy requirement which lends itself to supply from high capacity, central generating stations.

LOOKING even farther into the future, McCune sees beyond fission the possibility of obtaining controllable energy from the fusion of light atoms instead of from the fission of heavy ones. He said:

> In fact, certain distinct advantages of fusion over fission make the problem of the control of this reaction one of the greatest challenges to science even today.
>
> For one thing, the fuel supply for this reaction, consisting of deuterium—or heavy hydrogen atoms obtainable from the ocean—is literally inexhaustible.
>
> For another, the cost of extraction per energy unit of deuterium, even today, if we knew how to use it, is only a fraction of the cost of obtaining coal.
>
> Finally, the problems of atomic radiation and the disposal of radioactive waste are far less serious for fusion reactions than for the fission process.

It may well be, McCune concluded, that other scientific approaches entirely unknown to us or purely conjectural at the present time may provide us with substantial energy sources. What is certain now is that the world will be concerned more and more deeply over the problem of providing an increased standard of living for its population, and this can only be done by greatly increased supplies of available energy.

TVA and Fiscal Reform

A SPOKESMAN for the electric utility industry appeared before a congressional committee last month to urge that Congress continue its direct control over TVA's operations, in voicing opposition to proposals that TVA use revenue bond financing to expand its operations.

Speaking in opposition to proposed legislation which would authorize the TVA to issue revenue bonds to finance future additions to its power system, Walter H. Sammis, president of Ohio Edison Company, Akron, Ohio, and a former president of the Edison Electric Institute, told the House Flood Control Subcommittee of the House Committee

on Public Works that the revenue bond proposal could "impede, if not permanently bar," the corrections of the tax and interest inequities inherent in TVA's electric operations.

Sammis called on the Representatives and Senators from all the states to continue to maintain primary and enveloping control over TVA "to assure that TVA fulfills the purposes for which it was created, and that it does not either encroach upon the service areas of regulated and tax-paying utilities outside its zone of operations or drain off industry from other states through the creation of large and constantly expanding blocks of subsidized power."

THE utility president testified he knew of no constitutional or statutory mandate requiring TVA to assume the exclusive responsibility of furnishing all present and future requirements in the area served by TVA, yet in 1948 "TVA took the position that its power business was not incidental to navigation and flood control and avowed its function to be that of exclusive power supplier to the Tennessee valley region."

As to the revenue bond proposal, Sammis declared:

> The only source of funds with which to pay interest on and principal of such obligations would be from the sale of electricity, funds which even after giving effect to such financing will have been derived for the most part from the use of vast amounts of federal moneys heretofore furnished interest-free to TVA by appropriations by Congress. Thus, the proposed revenue bonds would be backed up by proceeds from the hundreds of millions of dollars of federal government expenditures already made and in effect subordinated to the new financing.

"To permit TVA to issue revenue bonds, as proposed," the utility industry spokesman asserted, "would inevitably result, I believe, in the unleashing of tremendous additional amounts of subsidized electric power upon an industry already unfairly affected by TVA's operations. TVA, as an unregulated monopoly, could ultimately destroy investor-owned companies now serving the areas to which TVA might expand, with the resultant loss over the years of billions of dollars in tax revenues to local, state, and federal governments."

COMMENTING on the proposed expansion of TVA's operations, he stated that the only obligation of the federal government is to see that there are no special obstacles to the providing of electricity in the Tennessee valley area by nongovernmental tax-paying sources. Sammis declared:

> If, in the future, the electric customers in the area served by TVA need more power I am firmly of the opinion that such additional power could be and should be supplied by investor-owned companies. I do not believe the federal government should engage in any proprietary business, including the electric power business, in competition with its citizens, where tax-paying businesses are willing and able to do the job.

Insisting that "fair play should prevail" in any federal participation in the power business by reflecting comparable costs of tax-paying electric companies such as the costs of money and the equivalent of federal, state, and local taxes, Sammis stated:

> If the federal government with the moneys of its citizens is going to compete with them in business, certainly it

"I DON'T KNOW, BILL. SLICE DOESN'T SOUND RIGHT. MAYBE THE BOSS SAID *SPLICE!*"

should be on an equal basis with investor-owned business, charging to such business the true costs of doing business, and not base its prices on subsidized costs at the expense of the customers of the investor-owned utility companies and other taxpayers.

Fourteen cents of every dollar collected from customers of the investor-owned utility companies through their electric bills, according to Sammis, goes for the support of the federal government and another nine cents for the support of state and local governments. He added that customers of government power agencies, on the other hand, are exempt from paying through their electric bills a share of the cost of the federal government, as government power operations do not pay federal taxes. In addition, he further stated that government power agencies make comparatively little, if any, payment in lieu of state or local taxes.

LOUIS V. SUTTON, president and chairman of the board of Carolina Power

& Light Company, appeared before the same House committee on behalf of the U. S. Chamber of Commerce. The chamber's opposition to the proposed legislation, Sutton stated, was based on four major factors: loss of congressional control over TVA activities, unsound fiscal procedure of federal revenue bonds, continued imposition on the nation's taxpayers, and increased competition with private industry.

On the first point, Sutton said there was a need for more, not less, control by Congress of government operations, especially of the business and industries being conducted by federal agencies and financed by the taxpayers. "It is axiomatic that government cannot, or will not, effectively police itself," Sutton testified. "A stockholder of a corporation can secure a court hearing on his complaints of mismanagement by the officers of his corporation, and the court will enforce its judgment rectifying the stockholders' grievances. The federal taxpayer, whose money is 'invested' in federal business undertakings, has no such protection. He cannot get a hearing in a court to present any complaints that he may have about mismanagement on the part of those in charge of the federal project. His only protection is a vigilant Congress holding a tight rein on the various agencies, and examining and weighing all their proposals with the utmost care and good judgment."

Sutton criticized provisions in the proposed legislation which would not only give TVA the authority to sell revenue bonds to the general public, but also authority to sell the bonds to the U. S. Treasury. In addition, the Secretary of the Treasury may also sell the bonds on the open market. Sale of the bonds to the Treasury, said Sutton, would mean that taxpayers would still continue to finance TVA's power expansion but without reference to Congress. Exemption of the bonds from state and local taxes is contrary to all existing federal borrowing practices, Sutton said, and would put TVA's bonds in the same tax-exempt class as bonds of state and local governments. "It is unsound fiscal practice for any federal agency and would constitute a further national subsidy to the users of TVA power," Sutton added.

If TVA were to be authorized to issue its own revenue bonds, Sutton thinks it is entirely possible that other agencies and offices of the federal government would seek similar authority. Such actions, he said, would remove federal programs further and further from congressional and budgetary control.

Even more dangerous than this would be the emergence of a dual budget for the government, Sutton continued, whereby expenditures for "reimbursable" federal public works shall not be included in the regular budget and shall not be subject to federal debt limitation. Even so strong a supporter of TVA as *The New York Times,* Sutton noted, finds this kind of management objectionable because, although dressed in the guise of business methods, the limitations to which a business is subjected when it goes into the market with long-term security issues—limitations to which the government is not subject—are completely ignored.

Another objectionable aspect to the TVA bond revenue proposal is that for a long time to come the bonds would be amortized not by revenues from the facilities previously constructed with the proceeds of the bonds, but by revenues from the facilities previously constructed with appropriated funds and with the reinvested revenues of such appropriated funds. "Thus the taxpayers all over the country," Sutton commented, "instead of receiving back principal and interest on

their forced investment in TVA would for some time be paying most of the principal and interest on the revenue bonds."

Sutton called the bond revenue proposal a new device for perpetuating and enlarging the TVA electric power system. "Merely changing the method of financing this federal utility does not resolve the basic issue—that government should not use taxpayers' money to provide electric service for any section or area of the country," Sutton told the committee. "The pending bills do not remove the obligation of the federal government in the TVA area, but instead they propose to continue both federal appropriations and the use of federal credit to support additional borrowing from taxpayers." Sutton called for a halt to further federal investment in TVA and the repayment of the existing investment as rapidly as possible to the nation's taxpayers.

A FINAL chamber objection to the proposed legislation concerns federal competition with its private citizens. To continue to allow TVA to expand would extend and enlarge this competition, Sutton declared. He continued:

> TVA should be relieved of its function of producing and transmitting subsidized electric power in competition with private enterprise. TVA should conduct only its authorized nonpower functions. Eventually, the TVA power facilities should be transferred to local ownership and operation. This transfer should include transmission lines, steam plants, and hydroelectric plants at TVA dams, but not the dams or other related river-control facilities.
>
> Such a transfer from federal ownership would inevitably lead to increased rates to power users in the TVA area. The new owners would soon realize that their revenues were insufficient to cover their production costs, such as interest and taxes, which TVA has long ignored. The higher rates that the power customers would pay would necessarily include those elements of power cost which are now being paid by federal taxpayers all over the United States.
>
> Thus, the first step toward ultimate local ownership and operation of electric power facilities in the TVA area is to require TVA, with the advice and consent of the Federal Power Commission, to adopt power rates which would cover all costs of production and transmission, repayment of and a fair rate of interest on the remaining taxpayers' investment in power facilities, and the full equivalent of local, state, and federal taxes.
>
> Even if the above elements of cost were included, consumers of TVA power would still be served at rates lower than those required by investor-owned enterprise. This is true because government interest rates are lower, unpaid interest has been reinvested in TVA power facilities, unrealistic allocations of costs of multipurpose projects to navigation and flood control have reduced the apparent cost of power, and TVA's costs have never included interest during construction, or workmen's compensation.

SUTTON outlined before the committee a 10-point program devised by the U. S. Chamber of Commerce to correct most of the injustices which now exist and to accomplish much that should be done in the interest of the taxpayers of the country. The essence of the program, Sutton told the committee, is that eventually the electric power facilities of TVA will be sold to local private or public ownership, thus discontinuing the obliga-

tion of federal taxpayers for power supply in the TVA region. The program is as follows:

1. Establish the policy that no further funds from either federal appropriations or revenue bonds be used for construction or operation of TVA's power facilities.

2. Require TVA to develop a new power rate structure, in collaboration with the Federal Power Commission, which will reflect all costs, including interest, taxes, and amortization on a sound accounting basis.

3. Free TVA's distributing agencies from the "sole-supplier" clause of their contracts with TVA so that they may: (1) purchase power elsewhere; (2) build and operate power plants of their own, but not under lease or lease-purchase arrangements with TVA; or (3) sell power to TVA at full-cost rates approved by the Federal Power Commission.

4. Require TVA to continue repaying to the Treasury within forty years, or less, the funds invested in power, and to pay interest on the remaining Treasury investment at current rates of interest on long-term Treasury bonds.

5. Require TVA to pay to local and state governments the full equivalent of local and state taxes on like private enterprise.

6. Require TVA to pay into the Treasury, in addition to the principal and interest on invested funds, a suitable percentage of gross revenue in lieu of, and in line with, federal income taxes.

7. Require TVA to pay to the Treasury the depreciation accruals and surplus revenues, after other obligations have been met.

8. Until all federal funds have been paid back, with full interest, require that Congress retain full control of TVA policies; require that the present system of annual audits by the General Accounting Office be continued; and require that TVA comply with the Government Corporation Control Act regarding the deposit of its funds in the U. S. Treasury.

9. Limit TVA to its present service area.

10. Permit local private or public power agencies to purchase all or any part of TVA's power plants and transmission facilities, without preference as to whether the agency is public or private.

UNTIL completely relieved of its power functions, Sutton concluded, TVA should stay within its present service area and be limited to its existing facilities, and should give its primary attention to the statutory authority to serve domestic and rural needs. Additional power supply in the area should be provided by the industries and municipalities themselves, either through their own construction or by purchase of power from outside sources.

". . . . public relations came of age when we started thinking of it in terms not only of putting out fires but of fire prevention. Just as a corporation maintains a law department chiefly to help it understand and obey the law, so a corporation maintains a public relations department in order to help it understand public opinion and to merit public support."

—W. J. MCGILL,
General manager, industrial and public relations, Standard Oil Company (Indiana).

The March of Events

PIP Conference to Feature Atomic Power

THE accent will be on atomic power at the annual workshop conference of the Electric Companies Public Information Program (PIP), to be held September 25th to 27th at the Whittier hotel, Detroit.

The group will tour the Enrico Fermi atomic power plant under construction at Lagoona Beach, near Detroit. The program also includes a discussion of "Handling the Public Relations Problems and Opportunities of Atomic Power" by representatives of the Power Reactor Development Corporation and The Detroit Edison Company.

Other speakers include Walker L. Cisler, president of Detroit Edison; Dr. Claude Robinson, president of Opinion Research Corporation; Frank Holeman, Washington correspondent for the *New York Daily News;* and the president of the Edison Electric Institute.

Round-table discussion and panel sessions round out the program.

Florida

Bill to Change Municipal Gas Tax Law

A FLORIDA POWER & LIGHT COMPANY bill to exempt private or public utilities from municipal taxation on natural gas used to generate electricity was introduced recently in the state senate. The sole purpose of the bill, it was said, is "to prevent double taxation."

The measure, introduced by Senator Scott Kelly of Lakeland, would change the present law regarding utility franchises only by adding this proviso: "That sale of natural gas to public or private utilities, either for resale or for use as fuel in the generation of electricity, shall not constitute a taxable utility service."

Senator Joe Eaton of Miami took the bill under study to ascertain whether it would have any bearing on Miami's franchise agreement with the power company or on the city's powers of taxation.

Iowa

Iowa Cities Intervene

THE state supreme court last month permitted 18 cities throughout the state to intervene in a court fight between the city of Fort Dodge and the Iowa-Illinois Gas & Electric Company over utility rates. The litigation involves questions

of a municipality's powers in regulating utility rates and the method of determining rates.

The court battle started in district court when the Fort Dodge city council refused to grant a gas rate increase to the utility company. The utility then got a court order to keep the city from enforcing its rate ordinance and started collecting higher rates. A district court judge ruled in August, 1955, that the city ordinance rate was too low and the rate being charged by the company was too high. He ordered the company to refund some $175,000 to its customers. The company appealed to the state supreme court from the refund order.

The intervening cities will be allowed to file briefs and arguments which they think the high court should consider in making its decision. Attorneys representing the cities said the case will provide the court's first utility regulatory decision since 1909.

One of the issues involved is whether the utility's original cost or the replacement cost should be used as a rate base. The cities said they would face the cost of engineering studies if they had to find out how much a new utility plant and system would cost each time a company applied for new rates.

Cities allowed to enter the case were Ames, Boone, Burlington, Charles City, Clarinda, Clarion, Clear Lake, Davenport, Eagle Grove, Grinnell, Iowa City, Iowa Falls, Manchester, Mason City, Muscatine, Ottumwa, Sioux City, and Waterloo.

Kansas

Study of Rural Area Issue Proposed

A RESOLUTION introduced in the Kansas State Legislative Council recently called for a study by the interim research agency of a dispute between rural electric co-operatives and privately owned electric utility companies concerning dual or overlapping certificates, which permit more than one utility to serve a specific rural area.

A group of REA co-operatives earlier filed a petition with the state corporation commission asking for cancellation of such certificates. A bill to accomplish this was passed by the 1957 state house of representatives but died in the state senate.

The interim study resolution was sponsored by Senators Ryan (Republican) and Joseph (Democrat) and Representative Blythe (Republican).

Maine

House Approves Rate Measure

A BILL which would make "net prudent investment" the basis for valuing the property of public utility firms for rate-making purposes was passed by the state house of representatives and sent to the senate last month.

The bill would have the effect of deleting "current value" of property as a factor in determining a rate base.

It was reported that both Central Maine Power Company and the New England Telephone & Telegraph Company in recent years have won court backing for their contentions that the state public utilities commission did not give sufficient weight, in handling rate increase petitions, to "current value," which is one of several factors that must be weighed under existing Maine law.

Oregon

Bill to Examine Pension Funds Passed

A BILL giving the state public utilities commissioner authority to examine the pension funds of public utilities was passed by the state senate early last month after having been approved by the house.

Oregon law now regards contributions to such a fund as legitimate operating expense for rate fixing if they are approved by the U. S. Bureau of Internal Revenue, it was reported.

Texas

REA Bill Passed

A CONTROVERSIAL bill expanding areas which REA co-operatives may serve was given final passage by the state legislature last month and sent to the governor for signature. Legislation was sought by the co-operatives to overcome a ruling this year by the state supreme court that it was illegal for a co-op to serve anyone not a member, thus limiting their service to those living in rural areas and those not previously having electric service. The court ruling precluded REA's from continuing to serve their old customers in newly annexed areas in incorporated municipalities, some of which depend on REA power exclusively.

As given final state legislative approval and sent to the governor, the new measure permits REA service to be provided: (1) structure or point of delivery in a rural area not receiving central station service, although owners may receive utility company power at other points in either rural or nonrural area; (2) any structure or point of delivery in a formerly rural area annexed by a city previously served by an REA plus other structures in an annexed area to which utility company service is not available; (3) all persons in a city or town an REA is now serving if no utility company service was available when REA began serving it; and (4) all persons in rural areas who are not receiving utility company service.

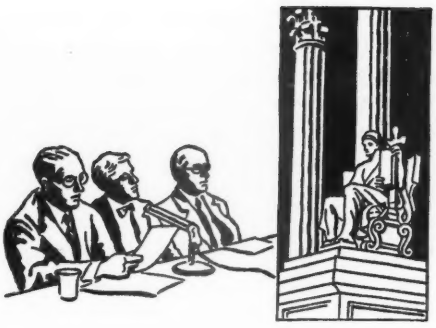
Virginia

Co-op Proposes Two Dams On Roanoke

THE Southside Electric Co-operative at Crewe, Virginia, has asked the Federal Power Commission for permission to start engineering studies of two proposed Roanoke river dams in Virginia. The two dams would be downstream from the Appalachian Electric Power Company's proposed Smith Mountain dam.

Southside's preliminary application proposes dams at Leesville and Taber. The application would permit the co-op to make such studies without a license being granted meantime to another concern. Southside's proposal for a dam at Leesville, upstream from Altavista, places the project about 20 miles downstream from the proposed Smith Mountain dam of Appalachian Electric.

The co-op, in its application to the FPC, said the dams would develop an estimated total annual output of 71.7 million kilowatt-hours of prime power and 20.9 million of secondary, or interruptible power.



Progress of Regulation

Trends and Topics

Service Denial When Customer Claims Offset to Unpaid Bill

THE right to discontinue service when bills are unpaid has been upheld by courts and commissions on the ground that a public utility company must obtain revenues promptly, without resorting to a multitude of lawsuits, in order to render efficient service. The right to deny service for nonpayment has, however, been restricted for various reasons. Arrearages of other persons at the same location, arrearages for service at another location, disputed bills, and unpaid bills for merchandise and jobbing might be mentioned as examples. In a few cases the question has arisen whether a customer may demand the continuance of service when he fails to pay a bill on the ground that he has an offsetting claim against the utility company.

Damage Claim against Electric Company

The Kentucky court of appeals recently decided that a customer of an electric company cannot justify his refusal to pay a utility bill by asserting a claim for damages which is unliquidated or uncertain (18 PUR3d —, 299 SW2d 817). This customer operated a sawmill to which the Monticello Electric Light Company had supplied electric power. When he received a bill for $177.05 for electric service, he deducted $75 and remitted the balance. He asserted the electric company owed him this sum, giving as a reason that one of his motors had been "burned out" because of low voltage caused by the company's negligence. Previous requests for settlement for the ruined motor had been refused. After his refusal to pay the balance of the bill for electricity, his service was cut off.

The court said that the general principle of law giving a public service company the right to deny service for nonpayment of bills is based upon a sound public policy which recognizes that it would be highly impractical to compel a utility company to resort to an infinite number of actions at law to collect small accounts from scattered consumers. The only qualification of the

rule is that the company may be liable for damages resulting from disconnection of current if the bill rendered is not just and correct. There was no dispute over the correctness of the statement rendered. The question was whether a customer "may arbitrarily adjudge his own claim to be well-founded and collect it by way of an unliquidated and unadjudicated setoff against a legitimate charge. . . ." The court said such procedure was unwarranted.

The Mississippi supreme court, in a similar case, held that Central Louisiana Power Company could discontinue service for nonpayment although the patron asserted a claim for unliquidated damages (PUR1927B 654). The customer claimed that he had been damaged in the sum of $56 on account of not being able to run his gin and gristmill while he was deprived of current by some mishap. He received a bill for $209.45 and sent the electric company a check for $153.45 along with his charge of $56 for damages. The company refused to recognize the claim and cut off the power.

The Mississippi supreme court held that an injunction should not be granted against the electric company under the circumstances. Enforcement of cut-off rules was said to be necessary to insure a reasonable revenue. The company could maintain an efficient service only through prompt payment of monthly bills.

A public utility should not be required to continue forced service until counterclaims for unliquidated damages are settled by the courts.

Solvency of Company as a Factor

One of the reasons for permitting an electric company to deny service for nonpayment even though a customer alleges a claim for damages is the fact that the customer can go into court, prove his claim, and collect from a responsible party. But even though the public utility is insolvent, according to an Illinois court decision, service may be denied for nonpayment (53 PUR NS 50).

A customer of Illinois Iowa Power Company alleged that the company was indebted to him for legal fees in excess of the amount he owed the company, that there had been a dispute as to the amount of the bills, and that the company was threatening to shut off service. The court upheld the right of the company to deny service. The court said it could see no reason why an insolvent utility corporation indebted to a particular customer on a charge not connected with a service charge should, in effect, be required to furnish continued service to such customer although the customer is in default and refuses to pay a bona fide claim for service already furnished him.

Utility Bills and Doctor Bills Do Not Mix

The Wisconsin commission criticized a telephone company for improper and discriminatory practices but denied the right of a customer to offset a disputed claim against the legitimate charges made against him for telephone service (PUR1917A 116). The decision was made in an unusual proceeding arising from a personal controversy between two physicians, one of whom happened to

be the owner and operator of the village telephone system. The other had established a hospital.

The controversy was permitted to become involved with the relations between the two men in their respective capacities as public utility operator and consumer; and the public utility was used as a means of retaliation by its owner. But even though the owner of the telephone company was at fault, according to the commission, the other physician should have collected his valid claims in a proper court action, and the utility was within its rights in insisting that such claims be adjusted without reference to charges for telephone service.

Service Denial by New Owner

Another question was also presented to the Kentucky court for decision, in the case mentioned above, because of the fact that the city of Monticello had taken over the facilities of the Monticello Electric Light Company. This led to the question whether the successor owner and operator of the electric system had the legal right to cut off the current in order to enforce payment of the bill. The purchase contract obligated the city to assist the selling company in collecting unpaid bills by cutting off service to delinquent customers in the same manner as the city would do to enforce collection of its own bills.

The customer argued that even if the city's predecessor could discontinue his current, the city could not do so. The court rejected this argument and pointed to the fact that if a seller of electric property might have to resort to the costly process of suing large numbers of persons for small amounts of money for the last month's bills, the seller would demand a higher purchase price for an electrical system. Furthermore, the court could not see any justice in permitting the delinquent consumer to invoke as a defense to discontinuance of his service the fact that the company he owed had been supplanted by a second company.

Review of Current Cases

Electric Company's Coal Purchases from Subsidiary Allowed as Operating Expense

THE Wyoming commission allowed an electric company purchasing coal from its wholly owned subsidiary for fuel at its generating plant to treat the cost as an operating expense for rate-making purposes. About 40 per cent of the coal requirements were purchased from the subsidiary and the balance was purchased from local coal producers.

The subsidiary, which strip mines coal and sells it to the electric company exclusively, was formed by the latter at a time when coal prices in the area were rising sharply. The company was unable to buy an adequate supply of coal from local dealers at what it considered reasonable prices.

The subsidiary coal operations have been profitable.

Claims of Objecting Parties

Parties objecting to the electric com-

pany's proposal to increase rates argued that its fuel cost should be reduced to the extent of the subsidiary's net earnings, that the separate corporate existence of the subsidiary should be disregarded, and that its profits should be combined with those of the electric company to determine operating revenues for rate-making purposes. The commission disagreed.

The commission observed that the price of coal in the area was well-established. The company purchased coal from its subsidiary at a lower price than from other producers in the area. Consequently, the commission said, the electric customers have been benefited by the intercorporate relationship. The commission observed that if it should accept the objecting parties' contention it would in effect be penalizing the company for its initiative and ingenuity in keeping available at all times an adequate supply of a needed commodity at a price beneficial to its customers.

Return Allowance

Existing rates had been yielding a return of 4.866 per cent. This was considered inadequate. The rates proposed by the company would yield a return of 6.552 per cent. The commission deemed this to be somewhat excessive. It concluded that a return of 6.25 per cent would enable the company to attract the necessary capital to finance extensions, improvements, and betterments of its local plant facilities in order to provide adequate service. In considering the company's revised tariffs, the commission said that it would be beneficial to both the company and its large power consumers if a differential were maintained between commercial and industrial rates.

The commission also considered the fair value rate base developed by the president of the electric company. It rejected this base, however, in favor of the net investment theory. It also adjusted the working capital item in the company's rate base exhibit to equal one-eighth of its operating expenses before depreciation and taxes, as adjusted. *Re Montana-Dakota Utilities Co. Docket No. 9309, February 28, 1957.*

Electric Company's Acquisition as Affected by Resulting Size and Economies

THE Securities and Exchange Commission, in approving Georgia Power Company's acquisition of the entire assets of Georgia Power & Light Company, considered whether the resulting holding company system would be so large as to be beyond the limits permitted by the integration standards of the Holding Company Act.

Resulting economies were also given consideration.

The addition of Georgia Power & Light's service area to that of Georgia Power Company, a member of The Southern Company holding company system, would cause the latter to cover virtually the entire state. However, the differences in relative size and type of system operation between the two companies were so marked as to lead the commission to the conclusion that absorption of the one company would not have a discernible effect upon the effectiveness of regulation. Furthermore, the acquisition would not, in any material sense, extend the Southern holding company system into a new area or region. Economically the service area of the company being acquired was

part of the area already served by the purchasing company.

Resulting Economies

Power costs in the southern portion of Georgia have been higher than those in the balance of the state. Georgia Power & Light Company's main source of electric energy has been from a Florida power plant of its Florida parent company, whose generating costs due to the nonavailability of hydro power or low-cost fuel are substantially higher than those of Georgia and the Southern system.

The higher operating costs in the southern part of the state have retarded the economic development of that area. Consummation of the proposed acquisition would correct this situation and permit the southern portion of the state to progress economically along with the remainder of the entire state of Georgia.

Further economies would result from the acquisition. For example, a saving of $600,000 in construction costs could be anticipated by reason of the fact that upon consummation of the transaction a projected transmission line of Georgia Power & Light would be shortened. Economies would also be effected in the raising of money for new construction by reason of Georgia Power Company's better credit rating. The acquisition would permit more effective utilization of generating facilities. Other savings would result from the construction of larger and more efficient generating units as contrasted with the higher fuel cost plants of the Florida Power Corporation holding company system. *Re Georgia Power Co. File No. 70-3547, Release No. 13398, February 27, 1957.*

Rate Increase Allowed after Adjustments to Claimed Rate Base and Rate of Return

THE New Jersey commission allowed somewhat less than half of the rate increase requested by the Plainfield-Union Water Company. Added investment and increased operating costs were cited in support of the need for more revenue.

The company did not contend for any one rate base but asked for rates which would afford earnings sufficient to carry on the business "in a way beneficial to the public and to our company." It presented an original cost valuation of $8,193,280 and an "average fair value" rate base of $12 million. The commission fixed a "fair and reasonable average" rate base of $7,925,000.

Land Value in Relation to Zoning Laws

The company's witness appraised some real estate at the best use permitted under the zoning laws. A part of the company's land was located in residential zones. Real estate valuation, the commission indicated, should reflect actual use rather than the best possible use. Moreover, sales commissions and other sales expenses should not be included for the purposes of a reproduction cost new rate base.

Piecemeal Construction Prices

The commission disapproved the use of prices for piecemeal construction since that would enhance the cost of reproducing the plant. It would be necessary, also, to adjust expenses to reflect economies of new substitute equipment in a reproduced plant.

The company sought to add 15 per cent to reproduction cost to account for overheads. It appeared, however, that over-

heads had actually been charged to expenses. The commission observed that to include overheads in reproduction cost in this proceeding would be to require customers to pay a return at current price levels on overhead costs already recovered.

Other Rate Base Adjustments

The commission expressed disapproval of the company's adjustments for contributions and customers' advances. The adjustments for these items, it was pointed out, were based on book cost whereas the property was valued on the basis of reproduction cost.

The proposed rate base was reduced by the amount of a profit on the sale of property which had been credited to earned surplus. The commission said the account should be credited to depreciation reserve. An allowance was made for cash working capital sufficient to cover cash requirements not provided through tax accruals and other sources of ratepayers' funds.

Rate of Return

The company attempted to show a rate of return requirement of from 6.50 per cent to 6.75 per cent. This claim was based on an alleged composite cost of capital of 6.30 per cent. Other factors were said to require an additional allowance. Apparently they were in large measure based on judgment figures. No specific calculations were shown in support of such figures.

The company's witness presented statistics of fifteen representative water companies relative to debt financing, while for equity capital he relied upon a study of ten companies. The commission found this statistical study "of little weight in arriving at a specific rate of return." The commission fixed 6 per cent as a fair rate of return.

Amortization of Rate Case Costs

Along with the costs of this proceeding, the company sought to amortize the costs of a 1954 rate case. The latter costs, however, were eliminated from the normalized expenses for the test year. Amortization should recover costs for the period benefited, or, as in this case, for the period in which the increased rates are effective. But the cost of two proceedings should not be amortized, said the commission, since duplicate amortization is not a normal or recurring situation. *Re Plainfield-Union Water Co. Docket No. 9523, March 19, 1957.*

Claim for Tax Deferral

In another water rate proceeding in which a 6 per cent rate of return was also allowed, the New Jersey commission rejected a claim, in the company's computation of income taxes, for the amount of a tax deferral resulting from the use of accelerated depreciation under § 167 of the Internal Revenue Code of 1954. *Re Bernards Water Co. Docket No. 9766, April 24, 1957.*

Customer Denied Right of Action for Restitution Of Charges under Unreasonable Rate Order

THE fact that a rate order is found to be unreasonable on appeal affords no right of action by a customer for restitution of an increase in charges collected during the pendency of the appeal. So ruled the Ohio supreme court upon appeal in such an action.

Under Ohio statutes, only the state su-

preme court has power to review a commission rate order. It is provided that any person aggrieved by a commission rate order may have it suspended, upon posting bond, pending a final determination by the supreme court as to its reasonableness and lawfulness. Moreover, the statutes allow a utility no option but to collect the rates set by the commission, and it is clearly forbidden to refund any part of the rates so collected.

Common-law Remedy Abrogated

Rates in Ohio, said the court, are subject to a general statutory plan of regulation and collection. They are solely a matter for consideration by the commission and the supreme court. Rates which are established by the commission after hearing and consideration in full compliance with the law, and until such time as they might be set aside by the supreme court, are the lawful rates and the only ones that can be collected, in the absence of a stay obtained by an aggrieved person after posting bond. By providing a method whereby aggrieved persons may secure the suspension of lawfully established rates pending appeal, said the court, the legislature has completely abrogated the common-law remedy of restitution in such cases.

Equitable Considerations

The high court agreed with the trial judge that while it may seem inequitable for the company to retain the amounts subsequently held to be excessive, absolute equity in a particular case must sometimes give way to the greater over-all good. In adopting a comprehensive scheme of rate regulation, the legislature has found it impossible to do absolute justice under all circumstances.

It was observed, for example, that under present Ohio statutes a utility may not charge increased rates during proceedings before the commission seeking an increase, and losses sustained thereby may not be recouped. Similarly, a consumer is not entitled to a refund of excessive rates paid during proceedings before the commission seeking a reduction in rates. *Keco Industries, Inc. et al. v. Cincinnati & Suburban Bell Teleph. Co. No. 34916, March 27, 1957.*

Legally Effective Rate under FPC Regulations Is Amount Actually Paid to Producer

THE Federal Power Commission reversed an examiner's decision that the "legally effective rate" of a gas producer within the meaning of the commission's regulations was not the dollars-and-cents rate a pipeline company was actually paying, but the rate which the pipeline company was obligated to pay under a contract. Section 154.94(a) of the regulations provides that no change be made in any rate, charge, or service in effect on and after June 7, 1954, for interstate transportation or sale of natural gas in interstate commerce subject to jurisdiction of the commission by any independent producer required to file rate schedules, without first filing a change in rates pursuant to § 4(d) of the Natural Gas Act.

In order to increase its rates under its FPC gas rate schedule covering the sale in issue, the producer, according to the commission, must file a "change in rates," and the filing of a revised billing statement does not suffice. There can be only one filed rate under which a particular sale

may be made. The rate which had been filed by the producer was the rate actually effective and actually being paid on June 7, 1954.

A revised billing statement to "correct" the billing statement previously filed with the commission, showing a higher rate which the producer claimed to be effective under a royalty escalation clause in the contract, did not meet the commission's requirements. The commission referred to its decision in Re Dorchester Corp. (1955) 11 PUR3d 189, and said that further, as pointed out in that case, a policy of accepting rate filings tentatively, subject to later and final acceptance of the rate the commission found to be the proper one, would be administratively unworkable, apart from any question of its legality.

No Determination As to Reasonable Rate

The commission further decided that it should not undertake to pass upon questions relating to the "correct rate" for the sale of gas or whether the producer should be required to decrease the charge for gas sold to the pipeline company by reason of certain price adjustment provisions contained in the contract. The commission had determined what the effective rate was and it had determined that the producer must file a change in rates in order to increase its rates. Beyond this, however, the commission said it was not required to go and should not go in this proceeding and at this time. It made no determination of the producer's just and reasonable rates since no such question was presented. Nor was it called upon to exercise any other regulatory function it possessed under the law. The commission said it would be unwise to attempt to determine the parties' rights under the contract at the time in the proceeding.

Dissenting Opinion

Commissioner Connole dissented with the statement that the principles which governed his separate statement in the Dorchester case became controlling in a rate proceeding. He said that fundamental principles of regulation prescribe that the effective rate is the rate actually binding on the parties by virtue of the rate schedule or tariff on file with the appropriate regulatory agency and limits a regulated company to charging this filed rate and no other. He expressed the view that the correct rate would be found in the contract between the parties, on the ground that the commission's rules in defining "rate schedule" mean the basic contracts and all supplements or agreements amendatory thereof effective and applicable on and after June 7, 1954. *Re Phillips Petroleum Co. Docket No. G-10908, April 5, 1957.*

Telephone Company Not Liable for Harassing Calls

AN interesting case recently appeared before the Alabama supreme court, in which a telephone company was absolved from responsibility for a private nuisance created by an individual who abused the service. A subscriber had sought to have the nuisance abated but the court, in upholding the lower court's dismissal of the action, held that responsibility rested with the individual who created the nuisance, not with the company.

The subscriber who instituted the action claimed that another subscriber had been using the phone to continually harass her and alienate the affections of her hus-

band. She requested that the company be ordered to monitor and keep complete records as to the date, number, and duration of time of all the calls made by the other woman.

She argued that the company, as a public utility, was under a duty to use all reasonable and proper means to provide effective, prompt, and adequate service to subscribers. It was claimed that the harasser's calls prevented the plaintiff from receiving adequate service. The court was asked to order the company, as an alternative to monitoring, to discontinue service to the other woman.

There is no question, said the court, that the telephone company has the duty to use all reasonable means to provide patrons with adequate and efficient service. But nothing had been introduced in evidence to show that the service was either inadequate or inefficient. The facts showed a personal controversy solely between the two women.

The telephone, continued the court, is a passive, impersonal service. If it is used as an instrumentality for the creation of a private nuisance, responsibility rests with the individual who abuses the service. The telephone company could not be held liable for interference with service in this instance since the cause was not traceable to negligence or intentional misconduct in respect of the duty the company had assumed. *Mickwee v. Boteler et al. 93 So2d 151.*

Condition Prohibiting Cash Dividends Attached to Telephone Rate Increase

In approving a telephone rate increase as modified, the Wisconsin commission found a return of 5 per cent on the net book value rate base reasonable, subject to the condition that no cash dividends be declared and paid on common stock at a rate exceeding 6 per cent annually of the par value of the common stock outstanding at the time of payment of the dividend. The condition is to remain in effect until common stock equity is equal to 40 per cent of total capitalization.

The telephone company was a closely held corporation in the process of conversion to dial service. Financing had been secured from the Rural Electrification Administration at a 2 per cent interest rate and a 35-year period for repayment of principal.

The ultimate amount borrowed would represent approximately 86 per cent of the total capitalization. The management of the utility, pointed out the commission, by virtue of diluting its equity from 53.1 per cent down to 13.6 per cent of total capitalization, and by investing the borrowed funds in automatic equipment to effect operating economies, had increased the dollar amount available to stockholders. The proposed rate would have produced an unreasonably high return. *Re Thorp Teleph. Co. 2-U-4716, April 4, 1957.*

Court Upholds CAB's Revocation of Registration

The United States court of appeals affirmed a Civil Aeronautics Board order revoking the letters of registration of four large irregular air carriers. The court's function on review, it was pointed out, was to determine whether the board's

findings were supported by substantial evidence. If so, the findings were conclusive upon the court.

The evidence showed that the course of conduct pursued by persons in forming a single integrated carrier operated in regular air transportation without a certificate of public convenience and necessity violated the Civil Aeronautics Act. Participation in such a venture by noncarrier persons constituted consolidation to operate separate properties in violation of law. Acquisition of control of the carriers by the individuals was also a violation.

Whether or not the action taken by the board was too drastic was not a question open for discussion on review, pointed out the court. It was clear that the board considered the record disclosed multiple independent violations, any one of which justified revocation of the letters of registration.

That the board possessed authority to revoke was clear.

The carriers involved had applied for and received their letters of registration subject to all terms and conditions of the Civil Aeronautics Act and the board's regulations. Upon compliance therewith depended even permissive authority to fly irregularly and, consequently, their exempt status. Carriers occupying a far more secure status, said the court, were subject to the board's sanction in the event of violation, whether it took the form of revocation or otherwise. *North American Airlines, Inc. et al. v. Civil Aeronautics Board, 240 F2d 867.*

Construction Program, Along with Increased Capital Cost, Figures in Additional Rate of Return Allowance

For the seventh time during the inflationary postwar period, the Kentucky commission has granted Southern Bell Telephone & Telegraph Company a rate increase. A rate of return of 6.35 per cent was allowed on a year-end net investment rate base, which was considered sufficient to enable the company to pursue its construction program expeditiously.

In arriving at this percentage, the commission considered Southern Bell's "imbedded" debt cost of approximately 3.12 per cent, the current debt capital cost level of 4 per cent or more, and the equity requirements ranging between 8 and 8½ per cent, together with the company's capital structure and the over-all Bell system capital structure and earnings.

The commission noted that something more than the 6 per cent allowance previously considered adequate should now be recognized as necessary, considering the rise in the cost of capital and particularly in view of the company's heavy construction program for 1957 and 1958. This rate of return was nevertheless considerably under the requested minimum of 6.75 per cent, but the commission thought 6.35 per cent would be adequate if the company should see fit to improve its low debt ratio.

Net Investment Adjusted

Southern Bell contended for a fair value rate base. Considering the original cost of its property, the estimated current cost, and the estimated existing depreciation, along with other elements of value, the company claimed that the fair value of its property used in intrastate service was $100.3 million as of September 30, 1956, the end of a 12-month test period. However, the commission thought the company's estimate of reproduction cost

was too speculative to be of much probative value.

The commission indicated that a net investment rate base adjusted "to reflect actualities" operative during at least part of the life of the rates to be fixed would be equitable. The commission accepted a net investment rate base of about $88,750,000 but deducted cash requirements, which were amply provided through tax and other accruals. In view of the company's $54 million construction program for 1957 and 1958, the commission thought some addition to the rate base would be necessary if the rates were not to become inadequate within a relatively short time. An allowance of nearly $9 million was accordingly added, resulting in a total rate base of almost $97.3 million.

Rate Schedule Fundamentals

The commission stated some fundamental principles governing telephone rate schedules. A telephone company furnishing service of broad scope and serving communities of varied size should have rates established on a statewide basis, the commission said. Such rates should be uniform under substantially comparable conditions for service in approximately the same size exchanges or calling areas. Residence telephone rates should be fixed at the lowest practical levels in order to promote the widest possible use.

The commission further stated that business telephone service and long-distance service should be priced at proportionately higher levels than residence rates in order for subscribers to secure certain advantages (including income tax advantages). Because of the greater value of telephone service in large exchanges, rates for local service should be established on a graduated scale in accordance with, but not necessarily in strict proportion to, the number of telephones within a particular local calling area. Finally, the commission said, rates should be such as may be readily understood by customers and easily administered by the utility. *Re Southern Bell Teleph. & Teleg. Co. Case No. 3229, April 22, 1957.*

Water Rate Increase Granted after Adjustments for Discriminatory Domestic Rates and Free Service

With only a few modifications, the Montana commission approved a rate increase requested by the municipal water department of the city of Bozeman. Revenues should be sufficient, it was noted, to enable the utility to pay necessary operating expenses, provide a reasonable reserve for depreciation, and allow for reasonable payments of principal and interest when expansion or plant additions become necessary.

In considering revenue requirements for reserves, the commission observed that rates which permit the accumulation of reserves in excess of those necessary to the operation of the water system are unreasonable and excessive. They are, moreover, often susceptible to a diversion for nonutility purposes, which is contrary to sound management.

Free Service to City

The commission disapproved the department's practice of furnishing free fire hydrant service to the city. Consumers who pay rates high enough to allow the furnishing of free service to other consumers, such as the city, are being subjected to discrimination. A municipal water department should be operated entirely

separate from other functions of city government. Water service furnished to the city should be paid for out of the city general fund, while any payments from water funds to city officials should be on the basis of time spent or work performed for the water department, the commission commented.

The commission found that discrimination as to consumers obtaining service at relatively high unit rates would result from the proposed application of straight percentage increases. This would be particularly true of domestic and household users.

The rates proposed for these consumers were therefore adjusted downward.

Municipal Control Ruled Out

A proposed rule to the effect that meters may be installed on any flat rate water service considered by the city commission, in its discretion, to be discriminatory was disapproved. The state commission refused to divest itself of its express statutory power to determine what rates or practices result in discrimination. The statutory authority was delegated exclusive of any regulatory control by a municipality. *Re City of Bozeman, Docket No. 4493, Order No. 2647, April 1, 1957.*

Economical Construction and Operation Held Preferable To Local Ownership in Rival Certificate Case

EVIDENCE was sufficient, the Idaho supreme court ruled, to justify the state commission in granting a certificate to Kootenai Natural Gas Company authorizing it to construct and operate distribution facilities to serve Kootenai county and the city of Coeur d'Alene. The city had granted the utility a franchise.

The company had made extensive surveys showing the economic feasibility of the project and the demand for natural gas service in the area. Moreover, as the Federal Power Commission earlier observed upon authorizing the transmission of natural gas to Kootenai county, the efforts of this company made possible the availability of natural gas in the area.

For its financial ability, the Kootenai company relied on a contract with Spokane Natural Gas Company of Spokane, Washington, whereby it would transfer its certificate and franchise rights to the Spokane company, which would undertake to construct and operate a distribution system in Kootenai county. The larger company had financial and engineering backing not comparably available to a small local operation, and it could obtain capital and materials and supplies more economically than a small company. The consequent savings would inure to the benefit of consumers in Kootenai county.

Rival Application

The rival applicant characterized this arrangement as a "sellout." It was urged that the commission should have given preference to local ownership and control proposed in the rival application. Local ownership and control, said the court, is a proper factor to be considered by the commission, and to be preferred where other considerations are in equipoise. But in this case it was shown that economic advantage to the consumers of Kootenai county lay in the contractual plan with the Spokane company.

Continuance Properly Denied

The rival applicant had sought a continuance of the Kootenai proceeding in

order to prepare its own case. But it made no showing before the commission to justify delaying the granting of a certificate and consequent service to the public. The rival, having filed its application before the other was granted, contended that the commission should have heard it before granting a certificate to Kootenai.

The court agreed that the public interest, which is the paramount consideration of the commission, is generally best served by a full hearing of all interested parties. Here, however, despite the commission's express invitation, no good reason was offered to justify delaying natural gas service to the public. *Re Kootenai Nat. Gas Co. 308 P2d 593.*

Unprofitable Telephone Co-operative Gets Rate Increase

A RURAL telephone co-operative showing considerable losses since it began operations in 1953 secured the Utah commission's approval of a rate increase. The co-operative anticipated serving over 1,100 residents initially but had only about 700 subscribers at the time of this proceeding. Many farm families, it appeared, had given up farming in the area and moved away. The proposed rates would afford a rate of return of only one-half of one per cent on a net investment rate base of approximately $468,000. Only interest had been paid on a debt of $528,000 owed to the Rural Electrification Administration.

A rate base, the commission indicated, should consist of the average net investment in service, plus the average investment in utility materials and supplies, plus an allowance for cash working capital. In this proceeding the year-end investment in materials and supplies was allowed, and approximately $3,000 was included for cash working capital. *Re Uintah Basin Teleph. Asso., Inc. Case No. 4393, March 27, 1957.*

Sole Proprietorship's Tax and Maintenance Expenses Trimmed by Commission

IN approving a small telephone company's application for authority to increase rates, the Wisconsin commission directed the company to put into effect schedules which would result in a return of 6.52 per cent on the net book value rate base. The company had included in its estimate of future expense the social security tax costs of the proprietor of the enterprise. Estimated income tax that would be paid if the company were a corporation, rather than a proprietorship, was also included. Such tax estimates, held the commission, were nonexistent costs and would be disallowed.

The commission noted that despite a voluntary company reduction in future maintenance expense, over-all expense was still unusually high. In considering the level of the cost of operating a dial telephone utility of such size, the commission said, the combined total cost of maintenance and general expense is significant. This is because the time of the owner or operating head of the utility and the resulting expense are allocated between these categories of cost. When compared with comparable exchanges in the area, the company's costs were approximately $5 higher on each station. The estimate was reduced accordingly. *Re Forestville Teleph. Co. 2-U-4752, April 23, 1957.*

Commission Denies Jurisdiction over Municipal Plant Rates

THE New Jersey commission ruled that it had no jurisdiction over water rates charged by a small municipality, even though the service was rendered to inhabitants of another community. The commission, like every other arm of the legislature, it was said, has only those powers delegated to it by the legislature.

To sustain the commission's jurisdiction, the complainant contended that the word "corporation," in a statute defining a public utility as including a corporation operating a utility service, should be construed to include a municipal corporation operating a water system. This contention was rejected. The commission noted that its jurisdictional position had been made clear prior to the enactment of legislation conferring jurisdiction over water rates charged by large municipalities supplying other communities. The legislature had not seen fit to modify the commission's interpretation of its jurisdiction with respect to small municipal systems. *Borough of Glen Rock v. Village of Ridgewood, Docket No. 9362, April 24, 1957.*

Telephone Rate Increase Conditioned upon Service Improvement

IN view of the need for improved service in the rural territory of a small telephone company, the Missouri commission authorized only one-half of a proposed increase in the company's rural rates.

Approval of the remainder of the proposed increase was conditioned upon a satisfactory improvement in service. The full amount of the requested increase was granted, however, as to municipal rates since municipal service was apparently satisfactory.

In determining revenue requirements, the commission indicated that earnings should be sufficient to enable the company to render adequate service, maintain its system, and attract the necessary capital to make needed improvements. Earnings should also be adequate to yield a reasonable return on invested capital.

Surcharge for Local Tax

The company was authorized to apply a surcharge to bills rendered to local subscribers in order to pass on to them the amount of a local gross receipts tax. Since the municipal customers receive the benefit of the tax, it would be unduly discriminatory to make rural customers bear this extra burden. It is within the commission's sound discretion, it was said, to determine what items of expense, if included in operating expenses, will result in undue discrimination, as well as to determine the proper treatment of excluded expense items. *Re Consolidated Teleph. Co. Case No. 13,610, April 30, 1957.*

Obligation to Serve Not Relieved by Delegation to Agency

THE Chicago & North Western Railway applied to the Wyoming commission for authority to discontinue all express service between certain points, and for authority to terminate its contract with a motor common carrier for the per-

formance of transportation service in connection therewith. The fact that the railway may have sustained a substantial loss in providing the service did not, in the commission's opinion, afford a basis for discontinuance.

The application was denied, the commission commenting that the use of the service and the adequacy of other forms of transportation were the primary criterions in gauging the propriety of approving the request. The effect of the discontinuance upon the public at large had to be considered, rather than the effect upon persons using the service. The railroad had failed to establish that the motor express service presently provided cost more than the passenger train service formerly provided for the movement of express traffic, and that public convenience and necessity did not require continuance.

Agency Function

Railway Express Agency had intervened in the case, seeking authority to discontinue service between the points in question if the commission granted the railroad's application. The agency, wholly owned and controlled by the principal railroads in the United States, had been organized in 1928 as a joint facility and a separate agency for the purpose of conducting and transacting express business moving over rail lines in the interest of better service to the public and economy of operation.

The agency performed unified express service for the railroads as their exclusive agent under an agreement approved by the Interstate Commerce Commission. Net revenues of the agency were distributed among the participating railroads, which had been divided into four territorial groups.

Chicago & North Western contended that it was not in the express business and that it was the obligation of the agency to furnish the service. The commission did not agree. The agency has no obligation to provide the service separate and independent from that of the railroad, pointed out the commission. The agency merely performed the obligation of the railroad to furnish the service as its agent.

Performance and Obligation Distinguished

There was only one obligation, that of the railroad. While the performance of the duty had been delegated to the agency under an express contract, the obligation to provide the service had not thereby been transferred. It remained with the railroad.

Moreover, said the commission, if the agency is required to furnish the service, any loss incident thereto would be distributed under the contract among all the railroads comprising the western group instead of being borne by the railway alone. The agency had the duty to protect all railroad principals from sustaining any additional loss in providing transportation service for the carriage of express traffic. *Re Chicago & N.W.R. Co. Docket No. 9156, Sub 1, April 30, 1957.*

Commission Order Directing Construction of Sanitary Facilities Affirmed

THE Ohio supreme court upheld a commission order directing a railroad to submit plans and proceed with the construction of sanitary facilities at an agreed location in its yard. The commission had found the working conditions so sub-

standard and inadequate that unreasonable interference with employees' ability to perform assigned work resulted.

The commission, said the court, has plenary power to promulgate and enforce orders relating to the protection, welfare, and safety of railroad employees. The court would not substitute its opinion or judgment for that of the commission on questions of fact, or reverse the commission order unless manifestly against the weight of evidence.

The appellants had contended that the order was unreasonable and unlawful because its indefinite and incomplete requirements afforded no standards for compliance. The controlling issue, answered the court, was the need for sanitary facilities for one portion of the yard.

The commission, in its order, directed the railroad to prepare plans and specifications for the toilet and washroom facilities and ordered that a copy be filed, with an estimate of time required to complete the facility and with evidence of mutual agreement as to the exact location. The court concluded that the order was not unreasonable or unlawful, and that it had afforded reasonable standards for compliance by the company. *Southern R. System v. Ohio Pub. Utilities Commission, 141 NE2d 149.*

Other Recent Rulings

Uniform Exchange Rates. The Illinois commission modified a telephone company's proposed rate increase so as to produce a return of 3.4 per cent on the fair value rate base, instead of 3.7 per cent under the requested rates, in order to bring the rates of the exchange under consideration in line with rates in effect at the company's comparable exchange, notwithstanding that the commission considered a return of 3.7 per cent moderate. *Re Woodlawn Teleph. Co. No. 43820, March 19, 1957.*

Capitalization as Rate Factor. The Connecticut commission, although commenting that it would not consider the necessity of meeting instalment payments on capital raised or borrowed for improving or enlarging a privately owned utility's plant and property in fixing the utility's rates, considered such a factor in granting a rate increase to a municipal water plant where a statutory limitation as to the terms and conditions of raising mortgage capital prevailed and the municipal plant was obligated to service bank loans which had been obtained to finance needed improvements in the system. *Re Portland Water Works, Docket No. 9308, March 28, 1957.*

Bus Operating Ratio. The Massachusetts commission approved a rate increase proposed by a bus company for intrastate operations, noting that even with the increase the operating ratio would still be in excess of 97 per cent, affording only a slim margin against unforeseen increases in expenses or decreases in revenues. *Re Vermont Transit Co., Inc. DPU 12069, April 5, 1957.*

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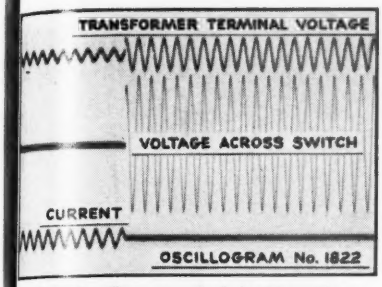

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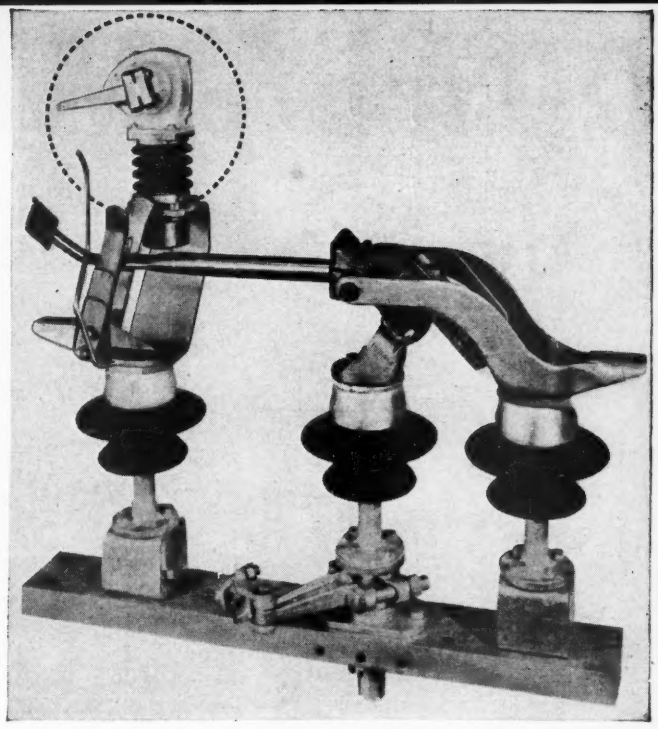

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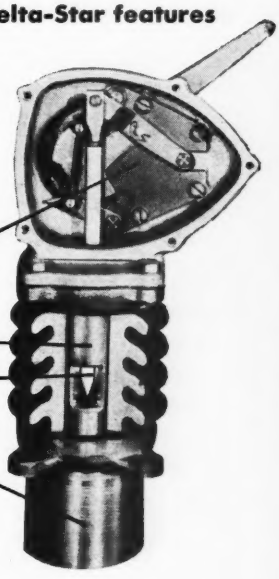

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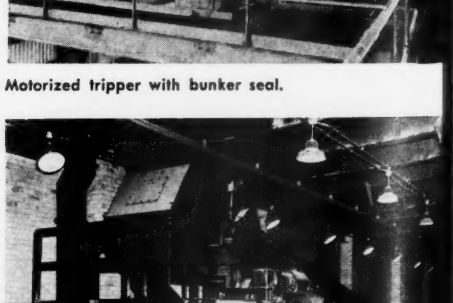

Chute arrangement at sampler and automatic weighing sta tion, also showing tramp iron chutes at the magnetic pulle

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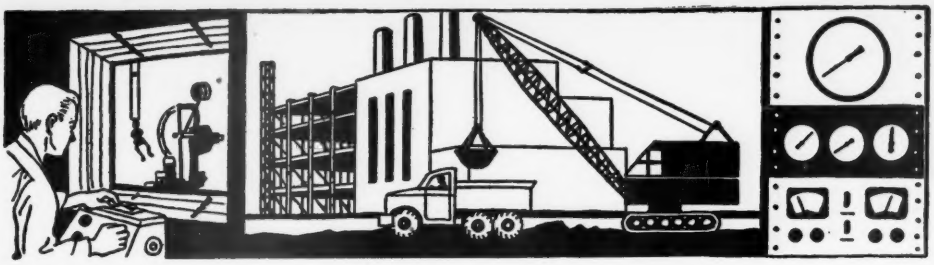


Industrial Progress

ctric Utilities' Current Reports derline Industry Power Surge

RECORD $38 billion is scheduled to be spent in 1957 by American ustry for new plant and equipnt. Utility companies alone plan an ease of 23 per cent in this type expenditure during this year. At current rate, the electrical indus- will double its productive capacity ight years. This will beat the in- try's past record of doubling in- try capacity in each ten-year iod.

The electrical industry has an en- ble record for not just meeting, anticipating demand for its serv- —industrial, commercial and resi- tial. Evidence of this surge of rgy may be seen in all sections of nation.

Making this expansion possible is average American who, through ownership of life insurance, or of ew shares of utility stocks, provide necessary capital. It is natural, refore, that electric companies in- m their investors through the com- y's annual report, of the construc- n planned for their system. The 56 annual reports are replete with h examples.

The excerpts below, taken from resentative electric utility annual orts, underline the extent of facil- expansion now underway and nned for the near-future.

Alabama Power Company, Bir- ngham, Ala. A continuing con- uction program required the ex- nditure of $30,549,671 in 1956. ring the year, the eighth generating it at Gorgas with a capacity of 6,250 kw went into operation and nstruction of a ninth unit of 165,- 0 kw was begun. Completion of ninth unit, scheduled for the first lf of 1958, will bring the total pacity at Gorgas to 711,250 kw. nstruction was started on a 225,- 0 kw addition to the Barry steam plant. At its completion, the capacity at Barry plant will be 475,000 kw, or nearly double its present capacity. The company's construction expenditures for the year 1957 are estimated at approximately $48,700,000.

American Gas and Electric Company, 30 Church st., New York, N. Y. The largest five-year expansion program in the history of the electric utility industry was undertaken by the AGE system during 1956. It will involve investment of $700,000,000 from 1956 through 1960, of which $170,000,000 is scheduled for 1957. As part of the program, the system has under construction 2,820,000 kw of additional steam-electric generating capacity, distributed among four existing plants and three new plants. All of it is scheduled to be placed in operation by late 1959. Capacity under construction is greater than the system's total capacity in early 1952. Its completion will raise generating capability to close to 7,000,000 kw. In 1956, investment for new facilities was $127,000,000, bringing postwar investment in new facilities to approximately $911,000,000.

Arizona Public Service Company, Phoenix, Ariz. To keep ahead of area growth, electric properties have required construction expenditures of $72,049,000 since the first of 1952. Construction expenditures for 1956 totaled $16,491,000, of which $13,385,000 was for electric additions and improvements. Plans call for expenditures of nearly $46,000,000 through 1958. Slightly more than 10 per cent of this amount will pay for initial phases of construction on a new 220,000 kw steam electric generating plant to be located at Tempe, Arizona. The company has entered into an agreement with the California Electric Power Company for the joint construction of a 160,000 kw generating station in southwestern Arizona near Yuma. Calectric will build the first 80,000 kw unit starting early in 1957; Public Service plans to install the second unit at a later date. By 1960, Public Service expects to have total electric resources of 529,500 kw available through company generation.

Arkansas-Missouri Power Company, Blytheville, Ark. Additions and improvements to the electric system totaled $1,392,000 during 1956. Investment facilities for the company and its subsidiary, Associated Natural Gas Company, have nearly quadrupled during the ten-year period from $8,064,349 at the end of 1947 to $31,812,948 at the end of 1956. Of the latter amount, $23,272,452 is invested in electric facilities.

Arkansas Power & Light Company, Little Rock, Ark. To keep abreast of area growth and meet the increasing demand for service in 1956, $7,479,054 was spent for expansion and improvement of the system. These funds were used primarily for improving urban and rural power delivery, improving high voltage transmission facilities, and extending service to new customers. Five 115,000 volt stations were completed and nineteen other stations were expanded or otherwise improved in 1956. A construction and expansion budget of $13,240,000 has been announced for 1957, the biggest part of which—75 per cent—will go for distribution improvements.

Atlantic City Electric Company, Atlantic City, N. J. Construction expenditures during the past ten years have exceeded $83,000,000 which is 61 per cent of the $137,000,000 total utility plant at the end of 1956. To keep pace with the growth of the area and to meet the ever-increasing demands for electric service, the

(*Continued on page* 46)

company's construction program for 1957 will require the expenditure of nearly $19,000,000. This includes about $4,400,000 to complete a 23,000 kw unit at Deepwater and $5,000,000 for a portion of the cost of installation of a new 79,000 kw turbo-generator at the same station. The balance will be for transmission, distribution and general plant facilities.

Baltimore Gas and Electric Company, Baltimore, Md. Of the $39,675,000 spent in 1956, for new plant and facilities, approximately $29,000,000 was for electric facilities. The initial 125,000 kw electric generating unit at the new Herbert A. Wagner station was placed in regular service in 1956, raising the total capacity of the company's steam-electric generating plants to 955,500 kw. Construction in preparation for the installation of the second 125,000 kw unit at the Wagner station was begun during the year. About 80 percent of construction expenditures in 1956 was for the expansion of transmission and distribution facilities. Sixteen new electric substations were placed in service and the capacity of nine existing substations was increased.

Bangor Hydro-Electric Company, Bangor, Me. The 1957 construction budget is estimated to require expenditures of approximately $3,000,000, about the same as the cost of the 1956 program. Work is progressing satisfactorily at Veazie on an additional steam unit of 16,500 kw capacity scheduled to be placed in service by the fall of 1957. Upon completion it will bring the fuel burning generation to over 50 percent of the total company generating capacity of 84,500 kw. In November, 1956, the company completed its 60-mile 115,000 volt transmission line from Veazie to Jonesboro. At the same time, a new 15,000 kva, 115,000/33,000 volt step-down substation at Jonesboro was placed in operation. Another major item of the 1956 budget was the installation of the new 60 cycle hydro-electric unit at the Milford station.

Black Hills Power and Light Company, Rapid City, S. D. Expenditures for new facilities during the fiscal year ending October 31, 1956 were approximately $1,800,000. Installation of a new 16,500 kw generating unit was completed at the company's Kirk plant for Rushmore G & T Electric Cooperative, Inc. at a cost of approximately $3,500,000. This unit, financed by Rushmore through the Rural Electrification Administration, has been leased to the company for 40 years. During the 1957 fiscal year, the company expects to spend approximately $2,100,000 for additions and improvements. A portion of this amount—$318,000, is a carry-over from projects not completed in the 1956 fiscal year.

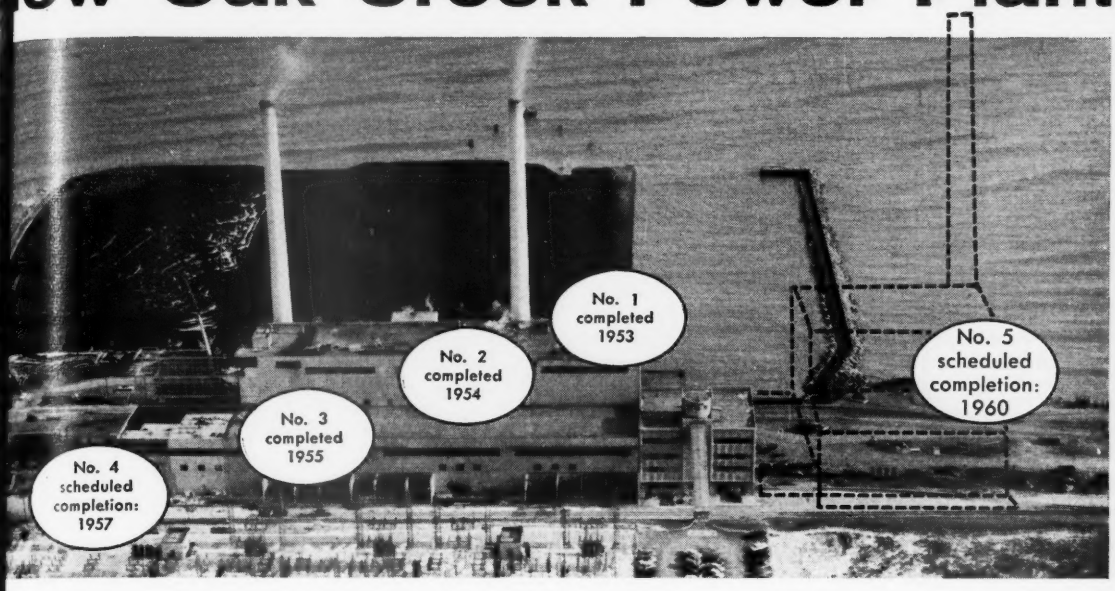
Boston Edison Company, Boston, Mass. Expenditures in 1956 were $27,388,251 as compared with $21,625,011 in 1955. It is estim that expenditures in 1957 will greater than 1956. Major proj completed or advanced during 1 include the continuation of work the installation of a fourth gene ing unit at Mystic station incr in high-voltage transformer capa at Waltham and Walpole transm sion stations; and net addition 125,300 kva of transformer capa at new and existing distribution s stations. The new unit at Mystic have a capability of 140,000 kw is scheduled to go into service latter part of 1957.

California Electric Power Co pany, Riverside, Cal. New c struction expenditures in 1956 w $17,500,000, an increase of 57 cent over 1955. Demands for ser will require an estimated expendit in 1957 of $22,630,000 for new tribution, transmission and gene ing facilities. The first unit of 60, kw capacity of the new San B nardino steam plant is scheduled go into commercial operation in J 1957, with a second unit of the sa size to be completed in June, 19 The company has entered into agreement with the Arizona Pu Service Company under which steam electric generating station, be known as the Axis steam pla is to be built and jointly used n Yuma, Arizona. The Imperial I gation District will participate using the output of the plant. C struction work on the first unit 80,000 kw is scheduled for comp tion early in 1959.

The California Oregon Pow Company, Medford, Ore. Gross penditures during 1956 for additi and improvements to electric pr erty, plant and equipment amount to $13,607,322. Lemolo No. 2 hyd electric plant with a capacity of 3 000 kw was completed during year. This is the eighth plant of company's North Umpqua river velopment. The year 1956 mark the beginning of development by company of the hydroelectric sources of the upper Klamath ri area, with an estimated power p tential of 315,000 kw. Constructi was started on the 80,000 kw B Bend plant, the initial unit of t overall plan. It is estimated that gro additions in 1957 will approxima $14,000,000. Approximately 72 mi of transmission lines and 195 mi of distribution lines will be plac

(*Continued on page* 48)

New Oak Creek Power Plant



Keystone of the Ten-year $300,000,000 expansion program

ANTICIPATING increased demands for electric service and the buoyant effect of the St. Lawrence Seaway — Wisconsin Electric Power Company launched a $300,000,000 expansion program in 1954 to practically double the capacity of generation, transmission and distribution facilities within a ten-year period.

The first three units of the Oak Creek power plant, with a total capacity of 370,000 kilowatts, were completed at one-year intervals beginning in 1953. A fourth unit will be completed late this year, bringing the total capacity of the plant to 500,000 kilowatts and the total dependable generating capacity of the system's power plants to 1,375,610 kilowatts.

Plans were recently announced for a fifth unit at Oak Creek. Scheduled for completion in 1960, the new unit will have a capacity of 250,000 kilowatts, approximately twice that of present units.

Within a 12,500 square mile operating area of diversified activity and stable growth, the Wisconsin Electric Power Company system serves well over half a million electric customers.

WISCONSIN ELECTRIC POWER COMPANY SYSTEM

in service, transmission and distribution substation capacities will be increased, a new service center built in Yreka, California, and other facilities added to meet continuing demands.

California-Pacific Utilities Company, San Francisco, Cal. Expanding electric power facilities, modernizing the telephone, converting to natural gas, growing with territory and helping raise its living standards —all have necessitated a continuation of an expansion program by CPU. Last year the company devoted $2,097,578 to new construction, and this year nearly $3,000,000 has been budgeted. The company operates properties in five states.

Carolina Power & Light Company, Raleigh, N. C. Expenditures for construction and purchase of facilities in 1956 amounted to $19,254,000. The principal item of construction was the completion of the 180,000 hp generating unit at the Cape Fear steam electric generating plant near Moncure, North Carolina. As of the close of the year, the capability of the company's generating resources, including purchased power, was 1,600,000 horsepower or nearly three times that of ten years ago. Construction planned for 1957 is estimated to cost $24,000,000 including $11,500,000 for new generating capacity. A 235,000 hp generating unit is under construction at the company's Cape Fear plant which is scheduled for completion by mid-1958. This will be the largest generating unit owned by the company.

Central Illinois Electric and Gas Company, Rockford, Ill. Construction expenditures for 1956 were $4,364,300. During that year the construction program consisted mainly of general improvements and betterments to the electrical and gas distribution systems of the company. Estimated construction expenditures for the year 1957 are $4,800,000. It is expected that the program for this year will also consist principally of reinforcing and extending the electrical and gas distribution systems to provide for additional growth in the company.

Central Illinois Light Company, Peoria, Ill. Capital expenditures for 1956 were $15,023,215, of w $11,869,475 was for electric facili Major projects included continua of construction of the 100,000 steam turbine generator unit N at the R. S. Wallace station on Illinois river at East Peoria. C construction included enlarge and extension of electric trans sion, distribution and substation cilities to supply new areas acqu through property exchange an expand and improve facilities meet growing needs in existing a The board of directors has appr a 1957 program approximating $ 000,000 for construction and property developments necessit by the growth of the territory business of the company.

Central Louisiana Electric C pany, Inc., Alexandria, La. struction expenditures for 1956 gregated $8,418,904, of which 043,040 was for electric facilitie new electric generating unit capability of 54,000 kw was pl in operation at the Teche p station, which increased the c

(*Continued on page* 50)

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bility of this plant to 78,000 kw. Ground was broken at the Coughlin power station for the installation of a 60,000 kw electric generating unit, scheduled for completion in April, 1958, which will increase the capability of this plant to 114,000 kw. The company's construction budget for the year 1957 amounts to $12,300,000, of which $8,920,000 is for the electric department. Included in the budget is $4,500,000 for the installation of the new 60,000 kw generating unit in the Coughlin power station, $436,000 for a 230 kv transmission line in the Covington division, and $1,272,000 for 138 kv lines and substations.

Central Maine Power Company, Augusta, Me. The company spent $15,591,493 for new construction and replacements in 1956. A principal item in this program is the new steam-electric plant being built on Cousins Island, in the town of Yarmouth, near Portland. Designed for an initial installation of two units with rated capacity of 44,000 kw each, the first unit is expected to be ready for operation by late 1957, and the other in the spring of 1958.

Central Power and Light Company, Corpus Christi, Texas. The company's expansion program continued at a rapid pace in 1956 with an expenditure of $16,029,970 for new service facilities. Highlights of the program were the completion of a 75,000 kw generating unit at Lon C. Hill power station, the construction of several new transmission lines and substations, and the continued expansion of the company's distribution systems. The new unit at the Lon C. Hill station went into service in April and doubled the capability of the plant. Late in the year, construction began on the J. L. Bates power station near Mission. This plant is expected to be ready for service in early 1958 and will have an initial net generating capability of 75,000 kw. Completion of the Bates plant will increase the system net capability to 650,300 kw, almost six times the amount of power available to customers 10 years before.

Central and South West Corporation, Wilmington, Del. The construction additions by subsidiary companies (Central Power and Light Company, Public Service Company of Oklahoma, Southwestern Gas and Electric Company, and West Texas Utilities Company) amounted to $60,997,000 in 1956. Included in the program was the completion of 332,000 kw of new generating capability, which comprised the following installations: Lon C. Hill station, South Texas, 75,000 kw; Knox Lee power station, East Texas, 87,000 kw; and Tulsa power station, Oklahoma, 170,000 kw. During 1956, Southwestern Gas and Electric Company commenced work on a new generating unit with a capability of approximately 114,000 kw, while Public Service Company of Oklahoma began the installation of a topping unit at the Tulsa power station which will increase the capability of that plant by about 40,500 kw. It is expected that these additions will be completed and in service in 1957. The 1957 gross construction budget is fixed at approximately $70,000,000.

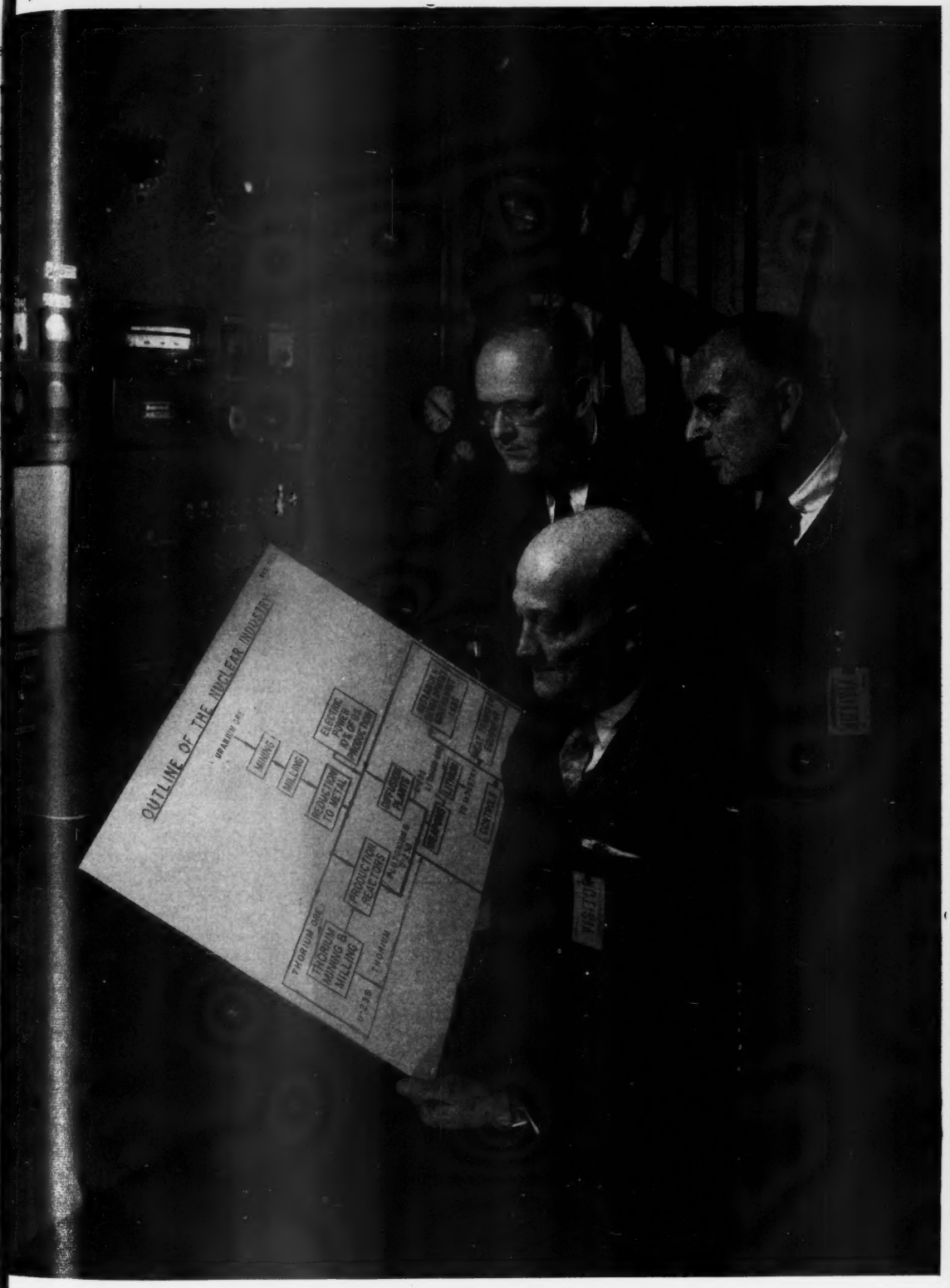
Central Vermont Public Service Corporation, Rutland, Vt. Capital expenditures for plant additions, replacements and improvements in 1956 were $2,480,997, compared with $2,023,593 in 1955. Most of the expenditures were for extensions, replacements and enlargement of electric distribution and transmiss lines and facilities.

The Cincinnati Gas & Elec Company, Cincinnati, Ohio. S stantial additions to plant were m on the company's system dur 1956. Construction expenditures d ing that year amounted to $24,0 000. Considerable progress has b made on the installation of a fou turbo-generator unit having a pacity of 172,000 kw at the Wa C. Beckjord generating station sch uled to go into service early in 19 Upon completion, the station's t capacity will be about 500,000 A new turbo-generating unit will be installed at the Miami F generating station. This unit, sch uled for completion in the fall 1959, will have a capacity of 172, kw, and will bring the capacity that station to approximately 530, kw, increasing the total generat capacity on the company's elec system to approximately 1,250, kw. Expenditures for 1957 and 19 are estimated at $39,000,000 and $3 000,000, respectively.

The Cleveland Electric Illu nating Company, Cleveland, Oh The company spent $26,100,000 d ing 1956 for addition, replacem and modernization of facilities. this amount $18,800,000 was sp for transmission and distribution i provements and additions. T fourth turbo-generator at the Ea lake power plant, the most power unit on the system, went into serv in March, 1956. A new 240,000 k $37,000,000 turbo-generator is sch uled to be in operation at the Ash bula power plant by year-end 19 Another turbo-generator, the eig for Avon plant, went into the co struction stage during the past ye This 250,000 kw unit is schedu to go into operation in 1959. Ad tion of the new Ashtabula and Av units will raise the company's to system installed capacity to 2,300,0 kw by 1959, an increase of 185 p cent in the span of a decade.

Columbus and Southern O Electric Company, Columb Ohio. Construction expenditures d ing the 11-year period since 19 have amounted to $165,200,0 bringing the plant investment at t close of 1956, after allowing f retirements, to $204,800,000, an i crease of 262 per cent. Generati capacity was increased from 210,9 kw to 540,000. Contemplated expe

(Continued on page 52)



At a laboratory, nuclear developments applied to the utility industry occupy the attention of officers from **Bankers Trust Company, New York.**

ditures for additions and improvements in 1957 total approximately $29,900,000. Of this amount $13,200,000 relates to production, $4,800,000 to transmission, $6,800,000 to distribution, and $5,100,000 to general plant projects.

Commonwealth Edison Company, Chicago, Ill. Expenditures in 1956 on new construction amounted to $137,300,009. Estimates for future construction through 1960 have been revised upward. As now scheduled, the four-year program calls for expenditure of $650,000,000 divided as follows: $190,000,000 in 1957, $170,000,000 in 1958; $140,000,000 in 1959 and $150,000,000 in 1960.

Concord Electric Company, Concord, N. H. Net plant additions of $133,629 were made during 1956. The additions were mainly increases to the distribution and transmission system to provide for the growing demands for electricity. It was also necessary to relocate a number of lines because of construction of the new toll highway between Concord and Manchester, New Hampshire.

The Connecticut Light and Power Company, Berlin, Conn. Approximately $22,500,000 was spent for new construction and equipment in 1956. A major part of this was accounted for by widespread additions to electric and gas distribution equipment. A significant share of this expenditure also went to pay for the completion of a new 106,000 kw generating unit at the Devon steam plant last spring, and for the start of construction in the fall on a twin 106,000 kw unit. The latter is scheduled to be ready in the fall of 1958. An additional 150,000 kw unit has been ordered. Continuing the extensive construction program calls for expenditure of $35,000,000 during 1957.

The Connecticut Power Company, Wethersfield, Conn. A total of $7,500,000 was expended during 1956 for improvements, additions, and replacement of plant. The electric department accounted for $6,400,000 of this total. A substantial part of this was spent to replace equipment and to extend and reconstruct the company's distribution system. The 1957 construction budget including $3,326,000 of work now in progress, will total $9,730,000. Of this about $3,137,000 is for electric transmission facilities and most of the balance, or approximately $6,593,000, will be spent for purchases of equipment, replacements and the work required to increase distribution system capacity and to connect new electric and gas customers.

Consolidated Edison Company of New York, Inc., 4 Irving pl., New York, N. Y. Expenditures for construction work in 1956 were $157,000,000. Construction of electric transmission and distribution plant accounted for the largest part of the capital expenditure, with $113,000,000 being used for this purpose. The 1957 construction budget is set at $146,000,000. For five-year period 1957-1961 the e mate is $650,000,000. New additi are under construction at the Asto and Arthur Kill station. Each house a 335,000 kw generating u The Astoria unit is to begin ope tions in 1958 and the Arthur K unit in 1960. Another similar unit planned for Astoria to be ready 1962.

Consumers Power Compa Jackson, Mich. Expenditures for ditions and improvements to elect and gas facilities amounted to $8 200,000 in 1956 and brought total for the ten-year period 19 1956 to more than $550,000,000. T company's electric generating ca bility was increased 10 per cent wh the fourth unit at the B. C. Co power plant at Muskegon was plac in service during 1956. With a pacity of 156,250 kw, the new u brought the Cobb plant's total pacity to 354,250 kw and that of company's statewide system to 1,71 888 kw. In the 10 years 1947-19 total electric generating capacity h been increased 168 per cent. Und construction as the year ended we three additional generating units wi a combined capacity of 562,500 k Expenditure of more than $95,00 000 in 1957 has been approved the board of directors.

The Dayton Power and Lig Company, Dayton, Ohio. Consi erable progress was made duri 1956 on the modernization of t Frank M. Tait generating statio work on which was started in 19 When it is completed in 1958, thr small units will have been remove two new 130,000 kw units will ha been installed and the capacity the station will have been increas from 210,000 to 410,000 kw. Tw new 130,000 kw turbine-generato will be added to the Frank M. T generating station, one in 1957 a the other in 1958. The compa estimates that it will need over $8 000,000 for new construction 1957-1958.

Delaware Power & Light Co pany, Wilmington, Del. Acceler tion of the company's regular co struction program, together wi work on the Delaware City genera ing station, required record co struction expenditures of $30,972,0 in 1956. The major part of the co incurred during the year was f additional electric generating faci

Expenditures at the Delaware plant alone amounted to $14,000 and $6,313,000 was spent the initial 80,000 kw unit at the ian river generating station in thern Delaware. Work was begun a second 80,000 kw electric gening unit at Indian river, which ld be completed by January 1, 9.

The Detroit Edison Company, roit, Mich. Gross construction enditures of $89,062,777 in 1956 e the second highest in the com-'s history, exceeded only by the 1955 when expenditures reached 616,872. A large portion of this unt was spent at the River Rouge er plant for steam and power erating facilities and in the transsion facilities to handle the power erated. The construction program xpected to continue at a high level ough 1957 with the expenditure an estimated $89,000,000 for new nts and other facilities.

Duquesne Light Company, Pittsgh, Pa. Gross construction exditures in 1956 approximated ,000,000. Major projects comted during the year included Forbes substation, which will supply the power for half of the downtown business section of Pittsburgh where the demand for electricity has grown substantially with the city's redevelopment program, and the addition of 150,000 kw of generating capacity at Phillips power station. Generating capability was increased from 1,075,800 kw to 1,225,800 kw, by the completion of the fourth generating unit at the Frank R. Phillips power station late in January 1956. Construction expenditures this year will be about the same as in 1956.

Eastern Utilities Associates, Boston, Mass. 1956 construction expenditures for the system's four subsidiary companies totaled $5,280,000. The largest single item of construction was an additional 115,000 volt transmission circuit between the Brockton area and Somerset generating station. This line provides necessary additional transmission capacity to meet the rapidly increasing demands of Brockton Edison Company customers. A total of $651,000 was expended on this line during 1956. Orders have been placed and initial construction started on an additional generating unit for Montaup Electric Company to go into operation in 1959. The new unit will have a rated capacity of 100,000 kw but is expected to have a capability of 112,000 kw. The total cost of the unit is estimated at $19,500,000. Construction expenditures for 1957 will approximate $12,000,000 of which about two-thirds will be required for the new generating unit at Montaup.

Edison Sault Electric Company, Sault Ste. Marie, Mich. Expenditures for construction in 1956 amounted to $989,338. Plans for 1957 call for continued expansion.

El Paso Electric Company, El Paso, Texas. The company expended on its construction program a total of $6,978,818 for new facilities during 1956 of which $3,190,567 was for construction work at the Rio Grande station on the 50,000 kw capability unit scheduled for operation about July 1, 1957. Preliminary engineering expenditures on an additional 50,000 kw unit scheduled for operation in mid-1958 were $15,747 and those for a proposed 80,000 kw

(*Continued on page* 54)

capability unit at a new site amounted to $64,267. The balance of $3,708,237 was expended for line extensions, substations, transformers, meters and other equipment required to serve new customers and loads added by present customers.

The Empire District Electric Company, Joplin, Mo. Construction in 1956 largely completed the program laid out three years ago to meet load growth, extend service, modernize equipment, and effect operating economies. Expenditures to carry out this three-year program amounted to $11,250,000. The largest single project completed in 1956 was a new boiler unit at the Riverton plant, costing in excess of $1,000,000. Distribution systems were expanded and strengthened in a number of communities. The program of extensive development of both transmission and distribution facilities in the central part of the system, begun in 1955, was largely completed. This program substantially increased the system capacity in the central area providing for future load growth and improving service.

Exeter & Hampton Electric Company, Exeter, N. H. Additions to plant to provide distribution facilities to meet increases in residential requirements and other demands for service amounted to $246,104 in 1956. Present indications point to continued expansion in the company's area in 1957.

Fitchburg Gas and Electric Light Company, Fitchburg, Mass. To keep facilities adequate to meet growing requirements, the company spent about $757,800 in 1956 for construction and new equipment. It is estimated that the 1957 construction program will cost about $650,000.

Florida Power Corporation, St. Petersburg, Fla. Major construction during 1956 was the completion of a new 70,000 kw unit at the Suwannee river plant and the start of construction on the new 120,000 kw Paul L. Bartow plant in St. Petersburg, which is scheduled to go into service in June 1958. Preliminary engineering and major equipment selection for a new 70,000 kw unit in the George E. Turner plant on Lake Monroe was started. It is estimated that the 1957 construc program will require $33,500,00

Florida Power & Light C pany, Miami, Fla. Expendit for new construction in 1956 to $43,599,000. Major expansion an increase in generating capab of 100,000 kw including the com tion of a new generating unit at Palatka plant, the addition of 1 miles of transmission and distr tion lines and new and expan substations totaling 185,871 With Florida's increasing indus development adding impetus to rapid growth, the ten-year const tion outlook has been boosted ano $61,000,000 for the period ending 1961. Originally set at $332,000 in 1951, it had been increased $435,000,000 by last year. The 1 budget calls for $66,000,000.

Georgia Power Company, lanta, Ga. Since the end of W War II, five new generating plant four steam-electric and one hyd electric—have been construc others have been enlarged, many s stations have been built and m miles of electric lines have been ad

NDUSTRIAL PROGRESS—
(Continued)

the company's transmission and stribution systems. Generating capacity has been increased from 606,-44 kw at the end of 1946 to 1,447,-80 kw at the end of 1956, with an ditional 250,000 kw under conruction at the beginning of 1957. onstruction plans for the next three ars (1957-1959) will require an timated investment of approxiately $155,000,000. More than 4,000,000 of the amount is included the 1957 construction budget. bout $2,400,000 of the planned exenditures for 1957 will be invested new and improved facilities for the eorgia Power and Light Company stem recently purchased by Geora Power Company.

Green Mountain Power Corporaon, Burlington, Vt. Gross additons to plant in 1956 amounted to 944,100 of which $899,700 was for ectric plant. Nearly 68 percent of is total went for so-called blanket ems or expenditures which are of continuing nature, such as short e extensions, transformers and eters necessary to serve new cusmers and provide for normal owth. It is expected that plant adtions in 1957 will amount to $936,-00. There are no large projects conmplated for 1957 and these exenditures represent estimated reirements similar to those in 1956 keep up with load growth.

Gulf Power Company, Pensala, Fla. Investment in new facilis during 1956 amounted to $4,219,-00. Preliminary engineering work mmenced in 1956 in connection ith the installation of a new 75,000 unit at Crist steam plant near ensacola. This plant was constructed 1945 with an initial unit of 22,500 capacity. A second unit of the me size was added in 1949 and in 52 a 30,000 kw unit was cometed. Although the plant was origilly designed for an ultimate caity of 100,000 kw, changes are ing made in connection with instaltion of the fourth unit to provide oling water and other facilities sufient to bring the ultimate capacity 225,000 kw. Construction plans the next three years (1957-1959) ill require an estimated additional vestment of $30,000,000.

Gulf States Utilities Company, eaumont, Texas. Gross additions to ant totalled $21,282,838 in 1956. his included $5,152,998 for electric oduction plant of which $2,539,053

(*Continued on page* 56)

was for completion of a 111,000 kw addition at the Neches station in Beaumont, Texas, and $1,037,510 for another similar unit there to be in service by April, 1958. Also included was $1,384,453 on the construction of a new power station which has been started north of Lake Charles, Louisiana, where two 111,000 kw generating units are to be installed, one to be in operation by May, 1958, and the other in the spring of 1959. Extensions and improvements to the electric transmission and distribution systems required $12,155,497. A four-year estimate of construction expenditures for the period 1957 through 1960 amounts to approximately $150,000,000. This includes the construction of two new power stations and carrying forward work on the installation of 819,000 kw of additional generating capability, all to be installed by 1962.

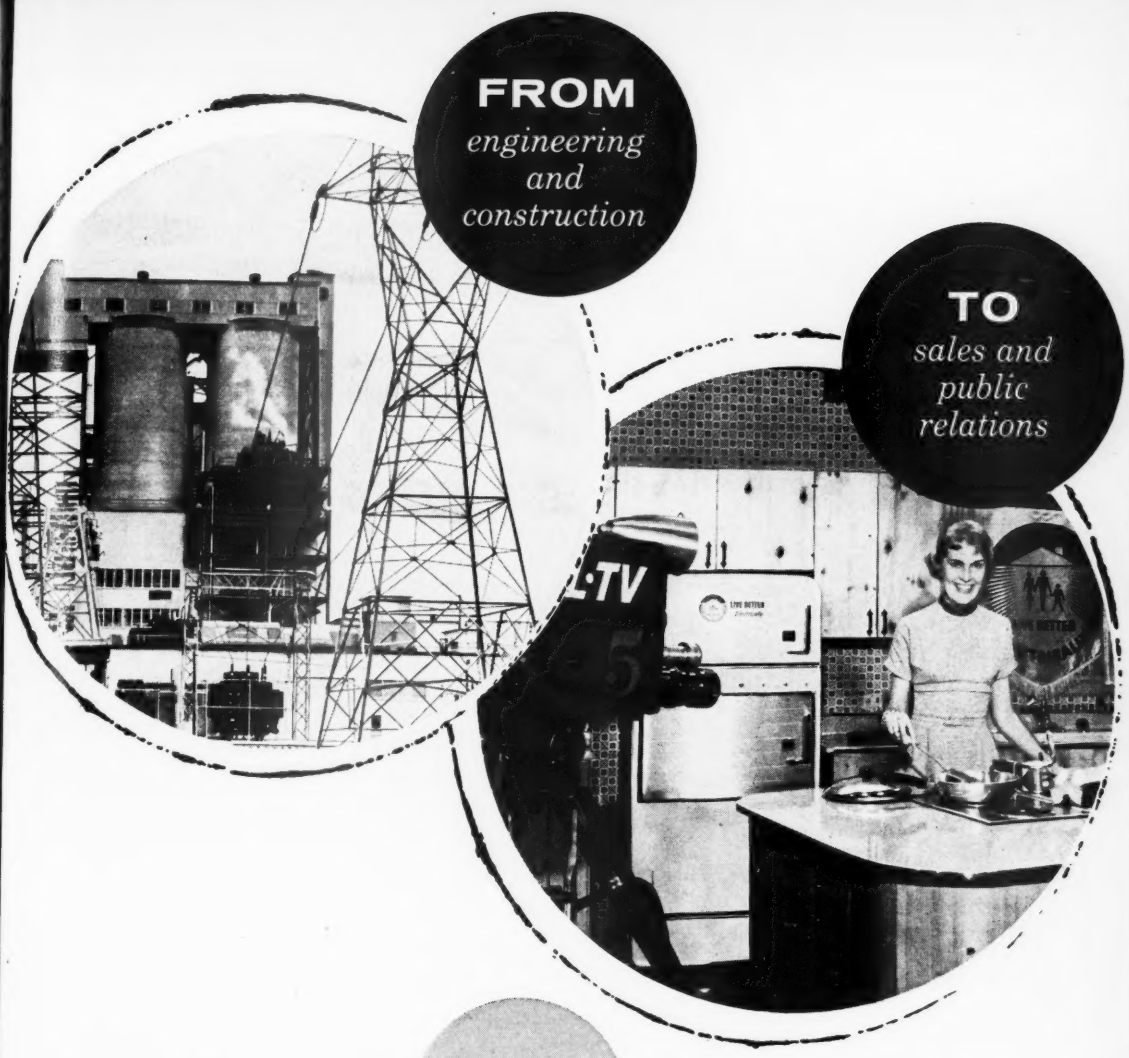
The Hartford Electric Light Company, Hartford, Conn. The company's construction program amounted to approximately $5,600,000 in 1956, and is expected to continue in 1957 at the rate of approximately $13,900,000. Progress was made during 1956 toward the installation of a second major unit of generating capacity at Middletown. This unit will have a rating of 100,000 kw and will be connected into the bulk transmission system. The continued increase in use of electricity in all phases of business required expansion of substation and distribution facilities at a high level. Several new substations were put into operation and many miles of distribution system were constructed or reinforced.

The Housatonic Public Service Company, Derby, Conn. The completed gross capital expenditures for the past year amounted to $2,370,484. Of this amount, $1,928,105 was spent on electric properties. The construction budget for 1957 calls for the expenditure of about $2,940,000 with $1,776,000 allocated to the electric divisions.

Houston Lighting & Power Company, Houston, Texas. Gross additions to plant in 1956 amounted to $32,038,497 making the year the second largest in expansion in the company's history. The additions included, in addition to expansion generating and distributing equipment, completion of two new service centers; seven major substations as well as enlargement of others; an expansion of the office quarters its Deepwater station. It is presently estimated that construction expenditures in 1957 will total approximately $69,000,000 and that they will rise some $75,000,000 in 1958, remaining at approximately the latter level during the several succeeding years.

Idaho Power Company, Boise, Idaho. The company's construction of new hydro generating plants on Snake river at the Brownlee, Oxbow and Hells Canyon sites, including related transmission facilities, will entail the expenditure of approximately $154,000,000—a major part of the company's over-all 10-year construction budget of $260,000,000 for new facilities of all kinds, covering the period 1956-65. During 1956 total expenditures for new construction amounted to $22,208,685, including work at Brownlee, preconstruction

(*Continued on page 58*)



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work at Oxbow, substation facilities and the expansion of transmission and distribution lines throughout the company's system. Construction expenditures for the year 1957 are budgeted at $47,184,000 including approximately $31,000,000 for the Brownlee project.

Indianapolis Power & Light Company, Indianapolis, Ind. Additions and improvements in 1956 amounted to $19,795,844. It is estimated that total expenditures for the four years 1957-1960 will amount to $59,123,738, of which about 52 per cent is for power plant projects and the remainder for transmission, distribution and other facilities. It is expected that $18,476,060 will be spent in 1957. Most of the 1956 construction expenditure was for two major plant additions—the completion of the 105,000 kw White river generating unit, and the foundation work of an identical unit at the Harding street plant. Operation of this unit is planned for 1958. Preliminary plans have been made to install another 105,000 kw generator by early 1961, thereby increasing the total capability of the system at that time to 837,000 kw.

Interstate Power Company, Dubuque, Iowa. In 1956 construction expenditures amounted to $8,019,034. This construction program included 66 miles of 161,000 volt transmission line, two major substations, and the beginning of the installation of a 33,000 kw steam generating unit and boiler at the Lansing, Iowa, power plant which will more than double the present capacity of the plant. This new unit is to be placed in service in September, 1957. The 1957 construction expenditures are estimated to be $9,800,000. This construction program includes completion of the installation of the unit at Lansing. The program also includes additional transmission lines and major substations, and normal additions to the distribution and transmission systems. Estimates indicate construction budgets of $8,500,000 in 1958, $10,400,000 in 1959, $6,760,000 in 1960 and $7,400,000 in 1961.

Iowa Electric Light and Power Company, Cedar Rapids, Iowa. During the year 1956 the company's investment in utility plant exceeded a hundred million dollars for the first time. Gross additions for the year amounted to $8,069,361 of which $6,615,458 was for electric property. The cost of the construction program for 1957 is estimated at $9,300,000 which includes approximately $3,700,000 for transmission lines and substations.

Iowa-Illinois Gas and Electric Company, Davenport, Iowa. Expenditures in 1956 for construction and acquisition of utility plant amounted to $8,742,158. The principal expenditure was about $1,750,000 spent during 1956 on the 36-mile 161 kv line, and the associated 69 kv lines and substations, interconnecting the company's electric facilities in Rock Island with those of Illinois Power Company at Galesburg, Illi... These facilities should be compl... in mid-1957, at an estimated t... cost of $3,420,000. A total of $... 196,000 is budgeted for 1957, ... which $10,475,000 is for electric ... cilities.

Iowa Power and Light Co... pany, Des Moines, Iowa. The b... get for 1957 has been approved ... the amount of $15,800,000. Appro... mately one-third of this amount ... resents contemplated investment ... wards the new 90,000 kw unit to ... installed at the Council Bluffs po... station. Another large item of $1,3... 000 covers the completion of the ... 161 kv transmission line betw... Council Bluffs and Des Moines. ... tegration of company system will ... consummated upon installation ... this new line. Total construction ... penditures since 1950 have agg... gated $72,000,000. Construction ... penditures amounted to $11,500,... during 1956.

Iowa Public Service Compa... Sioux City, Iowa. Gross expenditu... in 1956 for construction and ot... additions and improvements w... $5,071,807. Electric facilities requi... $3,659,713. Construction is schedu... to begin in June of this year o... 50,000 kw turbo-generator unit ... be added to the Maynard station ... Waterloo. When the new unit is co... pleted the latter part of 1958, ... capacity of this station will be in ... cess of 110,000 kw. Present pl... indicate an expenditure of appro... mately $6,665,000 for additions a... improvements to property in 19... Included in this amount is $1,525,... allocated to the new turbo-genera... addition in Waterloo.

Jersey Central Power & Lig... Company, Asbury Park, N. J. T... 1956 expenditures for plant a... equipment were approximately $1... 400,000. Among the major proje... completed or started during the y... were a 13.2 kv underground netwo... at Morristown and 115 kv subst... tion at Larrabee and Raritan riv... with their connecting lines. Work ... the second 138,000 kw generati... unit at the company's Sayreville s... tion on the Raritan river is und... way. This new $25,000,000 pow... plant addition, scheduled to go in... operation in the fall of 1958, w... increase the company's prime pow... capacity to approximately 509,0... kw or 3½ times as much as ten yea... ago. Approximately $22,500,000 h...

(*Continued on page 60*)

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been budgeted for new construction in 1957.

Kansas City Power & Light Company, Kansas City, Mo. Gross additions to utility plant amounted to $18,587,057 in 1956 and brought to approximately $191,000,000 the total investment in new plant in the ten years since 1946. The 1956 additions included approximately $5,200,000 for power production facilities and $11,000,000 for expansion and improvement of electric transmission and distribution systems. Construction costs in the Missouri-Kansas system for 1957 are estimated to total approximately $27,600,000. For the four years 1957-1960, the current estimate of construction requirements call for total expenditures of about $99,000,000.

Kansas Gas and Electric Company, Wichita Kansas. Gross additions to property, plant and equipment during 1956 amounted to $12,731,214, a large portion of which was used for the completion of the new 116,000 kw No. 3 generating unit at Murray Gill plant located 6 miles southwest of Wichita. The company's total generating capability is now 493,100 kw—more than 4½ times the system's capability at the end of World War II. The construction expenditures for 1957 will be about $9,500,000. This includes another new generating unit of 115,000 kw capability to be started at Murray Gill plant in September, 1957, with completion in spring of 1959.

The Kansas Power and Light Company, Topeka, Kansas. Construction expenditures during 1956 totaled $14,431,000. Expansion and improvement in the electric department accounted for $11,459,000. The largest single item was the construction of a new 90,000 kw turbo-generator, boiler, auxiliary equipment and addition to the Tecumseh station which was begun in 1956 and is scheduled for operation in June, 1957. A total of $862,000 was spent in 1956 for electric transmission facilities. Approximately $4,654,000 also was expended to build or improve electric distribution facilities. The 1957 budget for expansion and improvement exceeds slightly that of 1956. The largest items will be for completion of the 90,000 kw addition to Tecumseh station and the initial expenditures in connection with the addition of generating facilities to another power station.

Kentucky Utilities Company, Lexington, Ky. During the year 1956, gross additions to and replacements of plant totaled $15,378,477. Of this amount $5,895,329 was used for generating facilities; $2,898,815 for transmission facilities; $5,342,543 for distribution facilities. The company estimates that expenditures in 1957 will aggregate about $15,900,000. This estimate consists of $3,100,000 to complete installation of the first generating unit in the new E. W. Brown steam generating station; $600,000 for initial construction on the Green river No. 4 steam generating unit; $6,020,000 for high voltage transmission lines and associated terminals; $2,500,000 for 138,000 volt transmission facilities extending 119 miles; and $6,180,000 for other additions to the company's operating system.

Louisiana Power & Light Company, New Orleans, La. The year 1956 was another active one in the company's expansion program resulting in the expenditure of $17,180,303 in gross property additions. Major construction activity for 1956 had to do with the new 210,000 kw addit to the Sterlington station. This n unit, expected to be in commer operation in the summer of 1958, give Sterlington a total generat capability of 356,700 kw. During year the company purchased a site South Louisiana just above the B net Carre Spillway near Laplace a future generating station to known as Little Gypsy. It is expec that the next generating unit to added to the company's system South Louisiana will be on this n site. The company's construction p gram contemplates expenditures approximately $28,000,000 in 1957

Louisville Gas and Electric Co pany, Louisville, Ky. An aggreg of $15,065,100 was spent for ext sions, renewals and additions to el tric and gas facilities during 19 Of this amount, about 24 per c was for electric distribution lines, per cent for transmission and d tribution substations, 23 per cent steam production facilities and per cent for gas distribution ma and regulator stations. Other c struction projects accounted for remaining 10 per cent. Unit No. 100,000 kw capacity, was placed in eration in 1956, raising the Cane R plant's capacity to 200,000 kw. U No. 3, 125,000 kw capacity, has b under construction for about a y and is scheduled for completion the spring of 1958. It is anticipa that construction expenditures amount to approximately $24,000,0 in 1957 and $23,000,000 in 1958.

Lynn Gas and Electric Compan Lynn, Mass. The total amount sp for construction work and rela equipment in 1956 was $1,189,897 which $974,533 was spent by the el tric division. Construction of elect transmission and distribution fac tes accounted for the largest part the year's capital expenditures. C new substation was completed a work was started on two others.

Metropolitan Edison Compan Muhlenberg Township, Berks C Pa. Gross additions during 19 amounted to $13,658,149. A n steam generating station at Portla Pa., on the Delaware river is process of construction. The init unit scheduled to be in operati early in 1958 will have a rated cap ity of 165,000 kw and will cost estimated $26,000,000. In addition the large sums spent for the main nance, improvement and betterme

(*Continued on page 62*)

Detroit Edison Loops the Thumb

Last month a new high-voltage transmission line went into service in Michigan's Thumb area. This new transmission line around the Thumb will bring increasingly efficient service to this growing industrial and agricultural area.

Expansion is part of Detroit Edison's program of advance planning to keep ahead of the development of the territory it serves. Building for the future is Edison's daily job. The new 840,000-kilowatt River Rouge Plant will be completed next year. Scheduled additions to the St. Clair generating plant will increase capacity by 650,000 kilowatts. And construction is under way on the Enrico Fermi Atomic Power Plant.

By such investment, Detroit Edison has increased its assets to over one billion dollars. Investors have received 192 consecutive quarterly dividends, which have increased from $1.20 to $2.00 per share since 1950.

Detroit Edison is an essential part of the dynamic future of Southeastern Michigan, a future that will continue to bring benefits to customers and stockholders alike.

THE DETROIT EDISON COMPANY

Investing in a better future for Southeastern Michigan

of the transmission and distribution systems, 147 miles of lines and 46,235 kva of substation capacity were added in 1956. It is estimated that the 1957 construction program will involve expenditures of approximately $28,000,000.

Minnesota Power & Light Company, Duluth, Minn. Growth of the company's business and favorable prospects for even greater increases than were anticipated earlier have made it necessary to expand the Clay Boswell steam electric station, now under construction. Its initial generating capacity of 65,000 kw will be doubled to 130,000 kw with an additional identical unit. The site and plant design will permit a capacity up to 400,000 kw if needed. Construction progress is on schedule and the initial unit will go into service early in 1958, and the second unit late in 1959. Cost of the enlarged Clay Boswell station will be about $25,000,000. Other expansion requirements such as lines, substations and other facilities will cost approximately an additional $16,000,000 including 1956 through 1959.

Mississippi Power Compan Gulfport, Miss. Construction e penditures amounted to $10,825,5 during 1956, the major portion bei for the new generating plant. It is a ticipated that $10,800,000 will be quired for construction in 1957. new generating plant is being c structed between Gulfport and Bilo The first unit scheduled to be in eration by early summer of 19 will have a generating capacity of 7 000 kw, with the plant designed an ultimate capacity of 500,000 k

Missouri Public Service Co pany, Kansas City, Mo. The co struction expenditures in 1956 property additions amounted to $ 200,989. Among projects complet or substantially completed during t year were the addition of new a greater capacity substation facilit at Raytown, Clinton, Appleton Ci and Trenton, Missouri and the i provement and extension of vario transmission lines. Additional e penditures were made during the ye for expansion of the company's d tribution systems. The compan construction budget for 1957 amou to $10,850,000, and is the largest its history. It includes proposed e penditures of about $3,600,000 connection with the construction an additional 22,000 kw generati unit at the Ralph Green plant at Ple ant Hill, Mo., scheduled for comp tion early in 1958. When placed service, this unit will provide a rat generating capacity of 44,000 kw this plant.

Missouri Utilities Compan Cape Girardeau, Mo. Again in 19 the company's expansion and i provement program continued at high level. Expenditures for constru tion during the year were $1,832,50 bringing the total expended in the la five years to $7,183,466. An importa item in the 1956 construction budg was the building of necessary termin facilities at the Viaduct substati near Cape Girardeau to permit t company to receive power from t new 138,000 volt transmission li being built by Union Electric Co pany of Missouri, now rapidly nea ing completion. The company's co struction budget for 1957, totals $1 415,057, with $969,653 allocated t the electric department.

Montana-Dakota Utilities Co pany, Minneapolis, Minn. Addition to the company's utility system du ing 1956, including work in progre

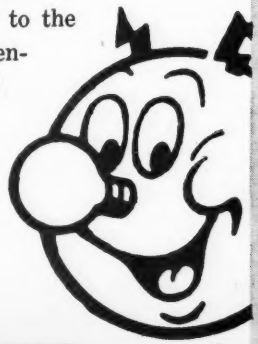
(*Continued on page 64*)

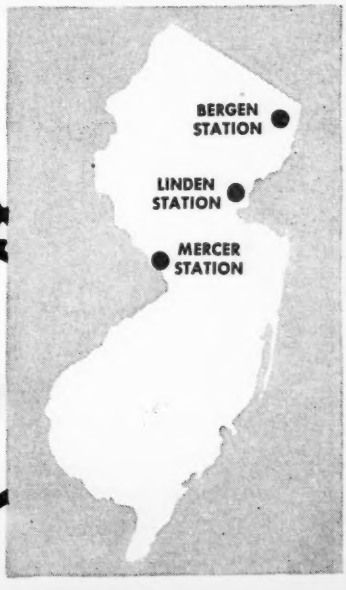
A CONSTRUCTION RECORD

ublic Service is building 3 electric generating stations at the same time

Three new electric generating stations — Linden, Bergen and Mercer — will add a total generating capacity of 1,330,000 kilowatts to the Public Service system. By 1960, electric generating capacity will be increased by 59%!

Building now — to meet future demands for electricity — will aid New Jersey's continued progress . . . and once again prove our faith in the future of this great state.





PUBLIC SERVICE ®

at year-end, totaled $8,364,447. Additions to the electric system during the year totaled $3,244,172. Construction was started on a 44,000 kw steam electric generating plant on the Yellowstone river near Sidney, Mont. The 1957 construction budget totals $12,000,000. Of this amount, $6,100,000 has been budgeted for the new Sidney plant. The balance of the budget represents improvements and additions to gas and electric transmission and distribution systems, including additional compressor station capacity.

The Montana Power Company, Butte, Mont. Investment in new plant and property during 1956 totaled $16,625,000 bringing to just under $99,000,000 the amount of money that has been invested in the last 10 years. To meet the growing demand for electric power in Montana, the company in 1956 started construction of its fourteenth generating plant, the 60,000 kw Cochrane hydroelectric development on the Missouri river. The construction schedule calls for completion of Cochrane by the end of 1957. When the plant goes into production, it will increase the company's system capability to 671,000 kw. A construction budget of $21,000,000 is anticipated for 1957.

New England Electric System, Boston, Mass. In 1956 the system spent $39,000,000 for additions and improvements to plants and properties. The new Samuel C. Moore hydroelectric development on the upper Connecticut river, with a capability of 190,000 kw, was placed in commercial operation January 1, 1957. Work on the addition of a 140,000 kw steam-electric generating unit at Salem Harbor, which was started early in 1956, is progressing according to schedule. The addition, which is expected to cost about $25,000,000 and be finished next year, will bring the capability of the Salem Harbor station to a total of 300,000 kw. It is expected that expenditures for new properties and additional facilities will continue at a rate of about $40,000,000 annually for several years.

New England Gas and Electric Association, Cambridge, Mass. Over $5,500,000 was spent by the system on new construction in 1956. The program was largely one of necessary replacement and the strengthening of both transmission and distribu systems. A third turbo-generato scheduled to go into operation in 1 at the Kendall station of Cambri Electric Light Company. The unit, of 27,000 kw capability, will quire the construction of an exten to that plant. At the present rate load growth an additional genera unit may be required at the New B ford plant within the next five ye The construction program indic that $34,400,000 will be needed in four years 1957 to 1960 inclusive.

New York State Electric & Corporation, Ithaca, N. Y. Expe tures in 1956 for construction of e tric and gas facilities amounted $24,200,000. A 6,100 kw addition the High Falls hydroelectric sta near Plattsburgh was completed construction was begun on the sec 135,000 kw steam electric genera unit at the Milliken station. The ter is scheduled for completion in fall of 1958. It is estimated tha three-year program through 1959 amount to $90,000,000. The projects are expected to cost $ 500,000. Over $15,000,000 will spent on new electric generat transmission and substation facil in 1957 including the expenditures the construction of the second un Milliken station.

Newport Electric Corporat Newport, R. I. Construction expe tures during 1956 totaled $504, Most of the expenditures were connection with routine additions improvements, such as short line tensions to serve new customers. major new projects are contempl for 1957 and construction requ ments for the year are estimate $306,400.

Niagara Mohawk Power C poration, Syracuse, N. Y. C struction expenditures were $66,9 000 in 1956. The Rainbow hydroe tric generating station was place operation in 1956, the third of the station development project of Raquette river in northern York. Both the fourth and fifth u are scheduled for completion service this year. Notable prog has been made on the construction the company's largest steam elec generating unit at the Huntley sta at Buffalo. This 200,000 kw gener is scheduled for operation in Nov ber, 1957. A second 200,000 kw for this station is being constru for operation in 1958. They will r the station's capability to 1,174, kw. Construction has been started

200,000 kw steam-electric generating units that will make the Dunk plant the second largest in the tem, with a capability of 612,000 . A 17,500 kw hydroelectric station at Prospect, near Utica, also was rted in 1956. It is scheduled for vice in the fall of 1958. The 1957 struction budget is $94,000,000, largest in the company's history.

Northern Indiana Public Service mpany, Hammond, Ind. Expditures for replacements, additns and improvements in 1956 were 2121,000. The new Dean H. tchell generating station at Gary s the largest single project in this gram. The first unit of this station ing 130,000 kw of capacity was ed in service in December. It is imated that the 1957 and 1958 conuction programs will cost $26,000,0, and $33,000,000, respectively. gest project in this two-year pro- m is the expansion of the Dean H. tchell generating station through addition of two 130,000 kw genting units. By 1959, the station's l net generating capacity will be 000 kw.

Northern States Power Comny, Minneapolis, Minn. During 6, $35,300,000 were spent for new struction. In order to meet steadily wing demand for electric and gas vices, it is anticipated that conuction expenditures during 1957 l total $43,000,000 and during 8, 1959 and 1960 will approximate 000,000, $53,000,000 and $47,-000, respectively. Major projects pleted during 1956 included Unit 5 of 100,000 kw capacity at High dge steam electric generating plant St. Paul.

Northwestern Public Service mpany, Huron, S. D. The 1956 struction resulted in a net addin of $2,528,029 to electric and gas ilities. A total of $7,469,371 has n spent in the past five years on ansion and improvement of facili-. It is estimated that $2,800,000 l be spent in the 1957 and $2,071,000 1958.

Ohio Edison Company, Akron, io. In the 11 years since the end World War II, the Edison System made expenditures for property itions and improvements totaling 2,380,000. In this period, genting capacity has more than bled, and work now in progress, n completed in 1961, will make system's capacity three and one times what it was in 1945. Exditures in 1956 were $51,886,013. Of this total, $47,019,970 was expended by Ohio Edison and $4,866,043 by Pennsylvania Power. The major power supply projects under way during the year were 90,000 kw addition to the company's Edgewater power plant at Lorain and the beginning of construction on a 90,000 kw addition to Pennsylvania Power Company's New Castle plant and on a new 680,000 kw plant of Ohio Edison at Stratton, Ohio, on the Ohio river. For 1957, expenditures of $68,850,000 have been authorized.

Oklahoma Gas and Electric Company, Oklahoma City, Okla. During 1956 construction expenditures totaled $22,887,000. In the ten-year period 1947-1956 the company spent a total of $166,675,000. A new 177,500 kw generating unit installed at Riverbank generating station, near Muskogee, was officially placed in operation

(*Continued on page* 66)

in 1956. With its completion, the company's system capability was increased to 728,900 kw. Construction was commenced on the installation of a new 177,500 kw generating unit at the Horseshoe Lake station located twenty miles east of Oklahoma City. When completed, in 1958, the new unit will increase the generating capability of Horseshoe Lake station to 267,500 kw, and will increase the system capability to 906,400 kw. In 1957, the construction budget will amount to $30,000,000.

Otter Tail Power Company, Fergus Falls, Minn. A five year construction budget has been set up totaling $43,000,000. This budget is broken down into the following categories: Plant construction—$24,000,000; Transmission — $12,000,000; Distribution—$6,000,000. A new generating unit addition to the Hoot Lake station is scheduled to be ready for service in the early fall of 1959. This unit, largest in the Otter Tail system, will have a nameplate rating of 53,500 kw and a maximum capability of 58,800 kw which represents an increase of over 40 per cent in system generating capacity and will cost $10,500,000.

Pacific Gas and Electric Company, San Francisco, Cal. Construction expenditures in 1956 totaled $148,000,000, an increase of about $15,000,000 over the prior year. During the year, the company added 215,000 kw to system resources. This consisted of a second steam unit of 165,000 kw capacity at the Morro Bay power plant and the first 50,000 kw unit at the new Humboldt Bay power plant. The company now has 4,528,500 kw of generating capacity in service, almost treble that in operation at the close of World War II. It is expected that construction expenditures will range from $175,000,000 to $190,000,000 annually over the next two years.

Pacific Power & Light Company, Portland, Ore. Construction expenditures in 1956 totaled $34,396,000 bringing the amount spent for construction since World War II to more than $182,000,000. New power projects placed under construction during 1956 will nearly double the company's generating capacity by the end of 1958. Plans for additional projects are being pushed. Included in the program is the proposed development of more than 1,000,000 kw on the Snake river in coöperation with three neighboring investor-owned electric companies. Looking ahead, to meet the continually growing demand for electricity, the company's present program contemplates construction expenditures of $56,412,000 in 1957 and $63,500,000 in 1958.

Pennsylvania Power Company, New Castle, Pa. Construction expenditures in 1956 totaled $4,866,043, compared with $2,490,736 in 1955. The principal project contributing to the increase is the construction of No. 4 unit (90,000 kw) at the New Castle steam-electric power plant. It is expected that this unit will be placed in operation as scheduled in the summer of 1958. The total generating capa ity of the plant will then amount 263,000 kw. The company conte plates that its construction progr for 1957 will amount to $13,000,0

Pennsylvania Power & Li Company, Allentown, Pa. C struction expenditures during year totaled $30,100,000 bringing postwar total to $373,400,000. A tion of a second unit at Martins C brings the generating capability b by the company alone since 194 a total of 745,000 kw. These additio bring the company total capability 1,481,500 kw. An estimated $23,9 000 will be spent in 1957 as the c pany looks ahead to a steady lo term expansion of business industry throughout Central East Pennsylvania coupled with a conti ing improvement in living standa The company, in 1958, will start c struction of a new coal-fired po plant on Brunners island, 15 m below Harrisburg on the Susqueha river. The new unit will be a 330, kw installation, twice as large as largest unit now in the PP&L s tem.

Philadelphia Electric Compa Philadelphia, Pa. The company continuing to expand its product and distribution facilities in order meet the rising demands for all clas of service. Expenditures for new c struction in 1956 were $67,543,6 Approximately $52,850,371 was sp for electric facilities. At the end 1956, total investment in facili was $927,500,000 compared w $425,000,000 at the end of the wa 1945. The next five years' foreca show a continuing upward tr which will necessitate further exp sion and improvement of the c pany's facilities. Expenditures more than $460,000,000 are e mated for the five-year period 19 1961 to meet these expected hig demands.

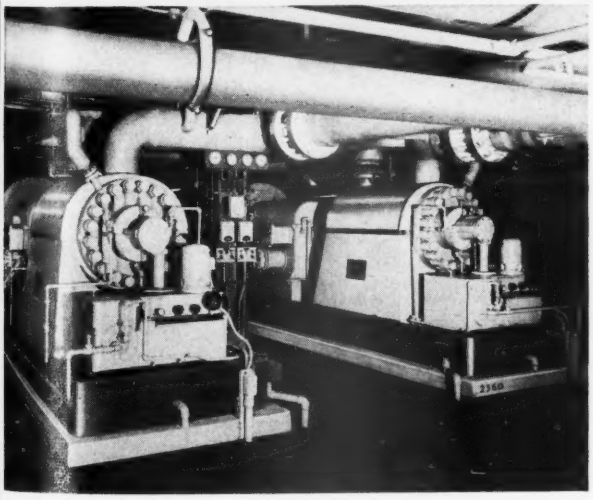
Portland General Electric Co pany, Portland, Ore. Construct expenditures in 1956 totaled ab $19,000,000, of which approxima 32 per cent was spent on new g eration. Construction was begun ea in the year on the Pelton project the Deschutes river. It is expec that this project, with all three 40, kw generators in operation, will on the line in March, 1958. By end of 1956, work was also under w on the North Fork-Faraday proj on the Clackamas river which toget will add 78,000 kw to PGE's g

(*Continued on page 68*)

Keeping up with the Kilowatts

PACIFIC BOILER FEED PUMPS FOR ELECTRIC UTILITY SERVICE

▲ Two Typical Pacific Boiler Feed Pump Installations ▼



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SOUTHERN CALIFORNIA EDISON *Company*
SOUTHWESTERN GAS & ELECTRIC *Company*
TEXAS ELECTRIC SERVICE *Company*
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erating capability. In 1957 the co struction program, including Pelt and North Fork-Faraday, will amou to about $35,000,000.

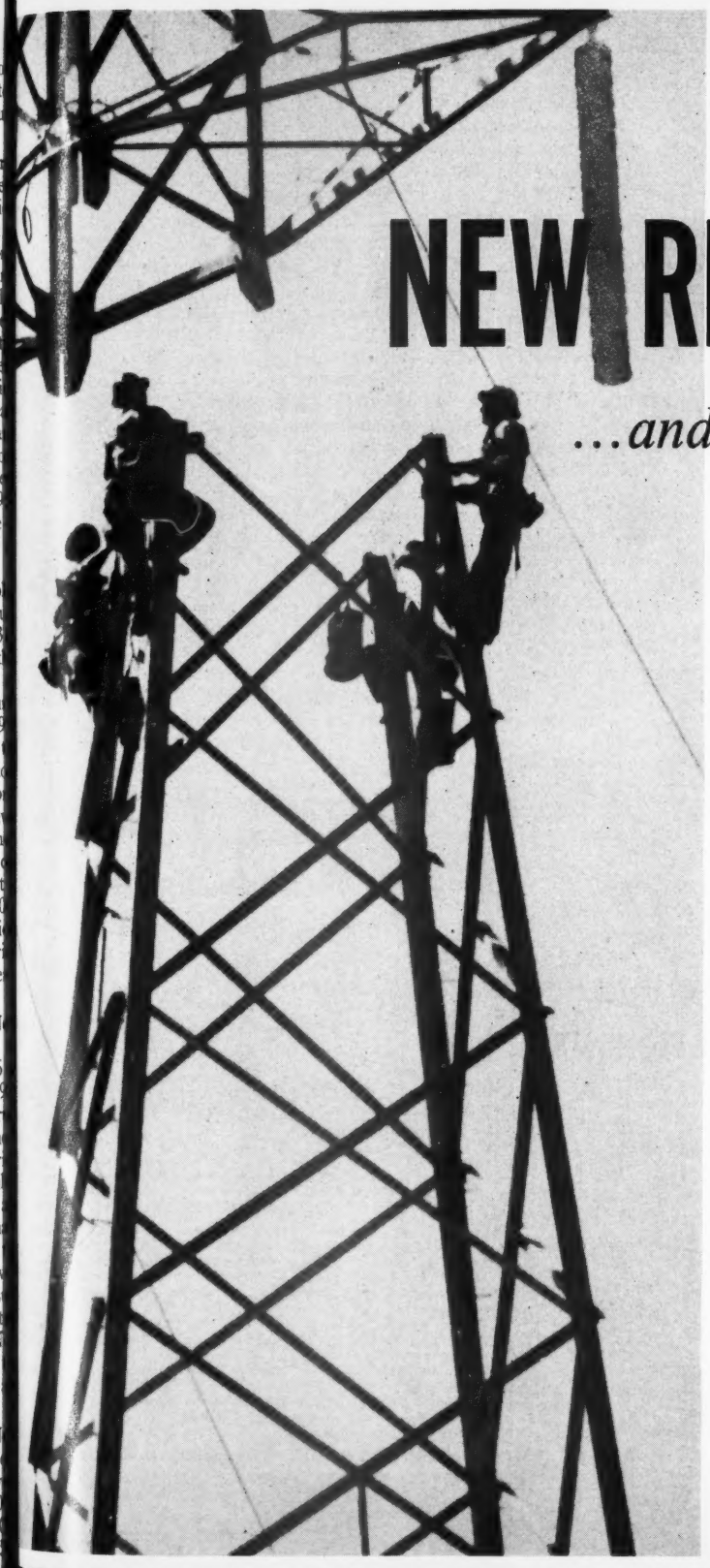
Potomac Electric Power Co pany, Washington, D. C. To me a steadily growing load, installati of the fourth turbo-generator unit the Potomac river plant was co pleted in February 1956. This u has a capability of 103,000 kw and gave the company a total syst capability of 988,000 kw. During five-year period 1951-1955, gross penditures for new constructi averaged about $20,000,000 per ye Due to commencement of large a important long-range projects, co struction expenditures in 1956 we $32,985,000 and for the years 19 and 1958 are expected to continue or slightly above this higher level annual expenditure.

Public Service Company of Co rado, Denver, Colo. The constru tion program in 1956 required $3 672,000, an all-time high. Of t amount, $24,178,000 was spent electric property. Total expenditu are estimated at $35,988,000 for 19 and in excess of $150,000,000 for five years beginning with 1957. A co tinuing power plant construction p gram is necessary to meet the e increasing electric demands. Two n generating units will be put into eration in 1957; a 100,000 kw unit the new Cherokee plant and a 22,0 kw unit at the new Cameo stati Construction will be started dur the year on the second unit of Che kee, rated at 110,000 kw.

Public Service Company of N Hampshire, Manchester, N. Construction expenditures in 1956 $11,226,103 exceeded those of 19 by $460,311. The principal constr tion activity in 1956 other than th largely of a routine and recurr nature, was the work at the Schi station on the installation of an ditional fuel-fired generating unit h ing a capability of 50,000 kw and construction of a 23 mile, 115,000 transmission line and associated s stations in the central part of the st between Campton and Ossipee, N Hampshire. It is expected that 1957 construction budget will proximate $11,200,000.

Public Service Company of N Mexico, Albuquerque, N. M. C struction expenditures for the y 1956 were approximately $4,190,0 of which approximately $1,403,0 was expended on Unit No. 4 (36, kw) at Person station. Current fo

(*Continued on page* 70)



NEW RECORDS

...and still climbing!

Helping to make possible continued progress in one of the nation's fastest growing regions, Southern California Edison chalked up these records in 1956.

- Electric energy transmitted *up* 12.2% . . . to nearly 14 billion kilowatt hours.
- Commercial meters *up* 58.7% over those added in 1955.
- Average kilowatt-hour consumption by domestic customers *up* 30% over the increase in either 1954 or 1955.
- Total meters nearly 1.5 million; *up* approximately 84,000 meters.
- New record highs in sales to commercial and industrial customers.

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SOUTHERN CALIFORNIA Edison

SOUTHERN CALIFORNIA EDISON COMPANY

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casts indicate the need for the expenditure of approximately $34,632,000 during the years 1957 through 1960, of which it is estimated $8,970,000 will be expended in the year 1957. A new power plant, designated as Reeves station, will be erected approximately six miles north of Albuquerque at an estimated total cost of $7,900,000. On-site construction of this new plant will start about January 1, 1958. Completion is scheduled for 1959. At December 31, 1956, the installed net generating capability for the entire system was 122,100 kw which will be increased to 158,600 upon completion of the fourth unit at Person station.

Public Service Company of Oklahoma, Tulsa, Okla. 1956 additions to electric facilities were $23,850,000. The first of two new 170,000 kw generating units at Tulsa power station was placed in service. Construction continued on a high pressure compound or "topping" unit which will add 40,500 kw to the plant's capability and will result in increased over all plant efficiency when completed in late 1957. Work was started on the addition of a second 170,000 kw turbo-generator with operation scheduled for March 1958. When this $40,000,000 construction program is completed, Tulsa station will have a capability of 483,500 kw and will be one of the largest west of the Mississippi.

Public Service Electric and Gas Company, Newark, N. J. Gross additions to utility plant totaled $123,875,260 in 1956 and total utility plant at the end of the year amounted to $1,063,318,784. Of this total, $724,759,124 was electric plant and $338,559,660 gas plant. As of December 31, 1956, the company's construction program amounted to approximately $345,000,000 of which upwards of $130,000,000 is expected to be expended in 1957 and the remainder in subsequent years. Construction of the new Linden generating station is nearing completion; and the two generating units of 225,000-kw capacity each are scheduled to be in operation in 1957. The construction work at the Bergen generating station is well under way. This station will have two generating units of 290,000 kw capacity each, one scheduled for service in the latter part of 1958 and the other in the early part of 1959. T company is planning the installati of a 300,000 kw turbine-generator f operation in 1960.

Puget Sound Power & Lig Company, Seattle, Wash. Gross a ditions to utility plant in 19 amounted to $22,606,960, the larg for any year in the company's h tory. Of this total, about $14,212,0 was required for expansion and i provement of transmission and d tribution facilities, $6,188,000 for n generation at Baker river and Sn qualmie falls and $2,207,000 for n office and service buildings. An e penditure of around $25,000,000 scheduled for 1957 as part of an a proximate $90,000,000 constructi program planned for the years 19 1959. This will increase the size the company by over 60 per cent. the $90,000,000 of new constructi some $40,000,000 is for the Upp Baker and Snoqualmie river hyd electric projects. The balance is f the expansion of distribution a transmission facilities and new off and service buildings.

Rochester Gas and Electric C

(Continued on page 72)

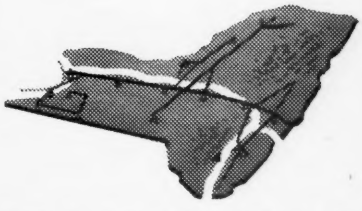
UPSTATE, N.Y."

YOU'LL FIND many large citi and famous industries in t 22,000 square miles served by t Niagara Mohawk system.

But this is also a land of small co munities, and thousands of busin enterprises. And the area ranks hi in farming, lumbering and mining.

In short, this region of three milli people has the diversity, the industr climate, and all the other essenti for sound, steady growth and progre

Electricity here is plentiful, a rates are among the lowest in t nation. There will always be plenty power for the home, factories a farms along the lines of the Niaga Mohawk system.



Buffalo, Queen City of the Great Lakes, is the sec largest city in New York State. It's the western termi of the New York State Thruway which runs through heart of the Niagara Mohawk System.

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NIAGARA MOHAWK

poration, Rochester, N. Y. During the past 10 years, $141,869,271 has been invested by the company in new plant. Construction expenditures in 1956 were $22,366,714 of which electric plant facilities cost $17,205,704. Work on the fourth generating unit at Russell station, and its related facilities, has been completed. This new unit was placed in use early in 1957 and provides an additional 83,500 kw of capability. The 1957 construction projects are estimated to cost over $20,000,000, of which electric department additions and improvements will approximate $13,000,000. Preliminary plans are being made for additional generating capacity needed within the next five years.

Rockland Light and Power Company, Nyack, N. Y. Construction expenditures by Rockland Light and Power and subsidiaries for 1956 amounted to $6,429,722. With completion of the Grahamville hydro plant in January, 1956, and of electric generating Unit No. 3 at the Lovett plant during 1955, generating capacity was more than doubled and is expected to provide sufficient capacity for several years. The 1957 program is expected to approximate $6,200,000.

San Diego Gas & Electric Company, San Diego, Cal. Gross capital expenditures in 1956 for additions to the company's physical plant totaled $18,185,185. Approximately 80 per cent of that amount was invested in electric department facilities. The major expenditure in the electric department was $4,148,800 for completing the installation of Encina power plant Unit No. 2, a turbo-generating unit having a capability of 106,000 kw. The total cost of its installation was $11,532,500. Work was begun on the construction of an addition to Encina power plant that will house Unit No. 3 which will have the same generating capability as Unit No. 2; its installation is scheduled for completion in July 1958 at a total estimated cost of $14,110,000. The budget for new construction in 1957 calls for the expenditure of $21,832,200, the second largest budget in the company's history. Approximately $17,000,000 is allocated to the electric department.

Sierra Pacific Power Company, Reno, Nevada. New plant facilities added in 1956 totaled $4,459,800. The second 120-kv H frame transmission connection with Pacific Gas and Electric Company was completed in D cember at a total cost of $897,4 Other large electric projects includ the extension of a high voltage tra mission line 28 miles from Linehou to Lovelock and the completion o new 60-kv line from the Mind Carson area to Lake Tahoe to m the rapidly growing electric load that region. With the continu growth anticipated for 1957, it is e pected that $2,899,300 will be quired for construction this year.

South Carolina Electric & G Company, Columbia, S. C. To gross additions to system propert in 1956 amounted to $9,987,000, which $8,376,000 related to elect plant. The system construction bud for 1957 amounts to $29,400,000, which $26,300,000 is assigned to el tric property. Included in the elect department budget, is $16,180,000 f 1957 construction requirements connection with the new high-pr sure McMeekin steam station, 27 000 kw capability, near the Salu hydro plant which is scheduled f operation in 1958. The new constru tion program of the system for t three-year period 1957-1959,

(*Continued on page* 74)

Alabama Power Company
Birmingham, Alabama
Georgia Power Company
Atlanta, Georgia
Gulf Power Company
Pensacola, Florida
Mississippi Power Company
Gulfport, Mississippi

A new chapter in the story of

SOUTHERN PROGRESS

The dynamic growth of the Southeast is reflected in The Southern Company's eighth annual report. The company, through its operating affiliates, continues to provide ample electric power to meet the increasing needs of this region . . . firm in the belief that *the forward march of the South is just beginning!*

Highlights of The Southern Company System's 1956 Operations

CONSOLIDATED NET INCOME of $30,133,000 exceeded 1955's by about 14%. Earnings per share increased from $1.34 in 1955 to $1.53 in 1956. The quarterly dividend rate was raised from 25c to 27½c per share, effective with the March 6, 1957 payment.

OPERATING REVENUES which first passed the $200,000,000 mark in 1955 amounted to $227,530,000 in 1956, an increase of some 9%.

OPERATING EXPENSES came to $98,228,000, approximately 8% more than in 1955.

SALES OF ELECTRIC ENERGY, amounting to more than 16 billion kilowatt-hours, were up 9%.

CUSTOMERS served directly numbered 1,372,000 at the year end, an increase of 4% over 1955.

CONSTRUCTION EXPENDITURES totaled $85,328,000 — approximately $12,000,000 more than in 1955. Plans for 1957 call for expenditures of about $140,000,000. New generating capacity totaling 865,000 kilowatts is presently under construction.

PURCHASE OF THE GEORGIA POWER AND LIGHT COMPANY PROPERTIES, negotiated in 1956, was completed in March, 1957, and Georgia Power Company began supplying electric service to approximately 40,000 additional customers in 20 south Georgia counties formerly served by the acquired system.

HYDROELECTRIC DEVELOPMENT IN ALABAMA will move conspicuously forward with Alabama Power Company's program for the construction of four new power dams and the enlargement of an existing dam and powerhouse on the Coosa River, and the construction of one dam and installation of electric generating facilities at two dams on the Warrior River. The program involves an ultimate installation of more than 600,000 kilowatts of hydroelectric capacity.

SOUTHERN ELECTRIC GENERATING COMPANY, owned jointly by the Alabama and Georgia Power Companies, was organized in May, 1956, to build and operate a large steam generating plant on the Coosa River, close to abundant coal deposits in Alabama and within easy transmission distance of the Georgia, as well as the Alabama electrical loads. First of the plant's four 250,000 kilowatt units is scheduled for completion early in 1960.

ATOMIC POWER RESEARCH was continued during 1956 by participation of the system companies with a group of other utility companies and manufacturers in the construction of a fast breeder atomic reactor near Monroe, Michigan. Through this work they expect to acquire technical knowledge and experience which will assist them in developing their own nuclear power plants at the appropriate time.

For a copy of the Annual Report write:
The Southern Company
1330 W. Peachtree Street
Atlanta 9, Ga.

"The last half of the twentieth century belongs to the South!"

clusive, contemplates expenditures of $75,500,000.

Southern California Edison Company, Los Angeles, Cal. A milestone in the company's continued growth was reached late in 1956 when its total gross plant account passed the $1,000,000,000 figure. The expansion represented by the building of new homes, new commercial enterprises, and new industries throughout the area necessitated a marked increase in the company's plant expenditures in 1956. Such expenditures are expected to be accelerated in 1957 to a total of approximately $135,600,000, the highest construction budget in the company's history. Two steam units, El Segundo No. 2 and Alamitos No. 1, each of 175,000 kw, and Portal power plant, a hydro unit of 10,000 kw, were completed in 1956; additional capacity under construction or on order, totals 1,150,000 kw.

Southern Colorado Power Company, Pueblo, Colo. Expenditures for new facilities during the year 1956 totaled $2,236,300 and were largely concerned with major substations and transmission additions or improvements as well as extensions for connecting new business. The construction budget for 1957 will total about $3,000,000.

The Southern Company, Birmingham, Ala. In anticipation of increased system load requirements, the operating companies (Alabama Power Company, Georgia Power Company, Gulf Power Company and Mississippi Power Company) plan the completion of an additional 925,000 kw of new generating capacity during the three-year period, 1957-1959, at which time the installed capacity of the system will be approximately 4,213,000 kw, nearly two-thirds of this will have been completed subsequent to 1949. Plant additions to be made during 1957 call for expenditure of $140,000,000.

Southern Indiana Gas and Electric Company, Evansville, Ind. Expenditures for property additions and improvements in 1956 totaled $4,543,684. Of this amount, $3,124,706 or 68.8 per cent, was spent for electric facilities. It is estimated that requirements for 1957 will be approximately $4,855,000.

Southwestern Gas and Electric Company, Shreveport, La. Expansion of plant facilities was carri forward intensively in 1956 to ke abreast of power demands. Constru tion expenditures exceeded $16,00 000, a record annual outlay for t purpose. A new generating unit 84,000 kw capability was placed service in 1956 at Knox Lee pow plant near Longview, Texas. This the fourth unit installed at the Kn Lee plant. Substantial progress w made during the year on the instal tion of a 114,000 kw generating u at Lieberman power plant near Mo ingsport, La. This unit will be t largest installed by Southweste The addition of this new unit will crease generating capability to 48 500 kw and raise total capability, cluding 41,500 kw of firm pow under purchase contract, to 524,0 kw. The 1957 construction progra contemplates expenditures of ov $17,000,000.

Southwestern Public Servi Company, Amarillo, Texas. Duri the 1956 fiscal year approximat $13,624,000 was expended for n facilities, thereby increasing gr plant account (including work progress) to more than $206,216,0

XDUSTRIAL PROGRESS—
Continued)

August 31, 1956. The company
s spent approximately $167,300,000
construction in the past ten years.
n expenditure of approximately
2,323,000 is expected for construc-
on of new facilities in the 1957
cal year. This budget includes a
rtion of the cost of the new 75,000
Cunningham station being con-
ucted near Hobbs, New Mexico.
his generating station is scheduled
r completion during July, 1957. The
58 fiscal year construction expendi-
res are expected to be approximate-
$10,950,000 and expenditures in
1959 fiscal year will probably
nount to $16,700,000.

St. Joseph Light & Power Com-
ny, St. Joseph, Mo. The expendi-
res for 1956 construction were $3,-
2,000. The largest single item was
,425,000 expended on the second
am electric generating unit at the
ke road plant which, when com-
eted will increase the generating
pability of that plant to 51,000 kw.
s completion is scheduled for Sep-
mber, 1957. The company has a
0,000,000 three-year construction
ogram. Approximately half of this
nount is for additions and replace-
ents to steam electric generating
uipment, including the 25,000 kw
it being installed at the Lake road
ant.

Tampa Electric Company,
ampa, Fla. Gross construction ex-
nditures for 1956 amounted to $16,-
3,566, of which approximately one-
lf was spent on the new Gannon
nerating station. Construction work
the first 125,000 kw unit is pro-
eding satisfactorily and the sched-
ed date for commercial operation is
ugust of this year. The second unit
the same size is scheduled for com-
etion during the last quarter of
58. Other major 1956 construction
nsisted of improvement to trans-
ission and distribution system and
new general office building. Con-
uction expenditures for 1957 are
timated at over $24,000,000 the
rgest program by far in the com-
ny's history.

Texas Power & Light Company,
allas, Texas. In order to carry out
s program of expansion, the com-
ny has invested $103,639,000 in new
d improved facilities during the last
e years. During 1956 construction
as begun on the Stryker Creek gen-
ating station, in East Texas. This
w plant, scheduled for service in
58, will have a name plate rating
125,000 kw. In preparation for con-
ued increasing demands for serv-
e, the company has placed orders for

(*Continued on page 76*)

(Continued)

equipment for the addition of a 2[illegible] 000 kw generating unit to its L[illegible] Creek plant in McLennan county, service in 1959. Construction of new Stryker Creek plant and enlar[illegible] ment of the Lake Creek plant [illegible] bring the company's total g[illegible]nerat[illegible] and purchased capability to [illegible]ore t[illegible] one million kw in 1959.

Texas Utilities Company, F[illegible] Worth, Texas. New electric g[illegible] erating units completed and placed[illegible] service during 1956 consisted o[illegible] 115,000 kw unit at Mountain Cr[illegible] station in Dallas and the second u[illegible] installed at Eagle Mountain stat[illegible] north of Fort Worth, the latter w[illegible] a capability of 175,000 kw. Six ma[illegible] power units are to be added to [illegible] electric system by 1959. The constr[illegible] tion of property additions in 1956 [illegible] the system operating companies [illegible] quired the expenditure of $61,08[illegible] 000. Construction budgets for 19[illegible] call for expenditures totaling $7[illegible] 000,000. In the three years, 19[illegible] through 1959, the construction p[illegible] gram, is expected to cost appro[illegible] mately, $267,000,000.

The Toledo Edison Compan[illegible] Toledo, Ohio. Construction expen[illegible] tures during 1956 totaled $10,661,0[illegible] including new transmission, distrib[illegible] tion and substation facilities and [illegible] beginning of work on a new ge[illegible] erating unit. Forecasted increases [illegible] the demand for power indicate th[illegible] additional capacity will be needed [illegible] 1959. Installation of a second 13[illegible] 000 kw unit at Bay shore station w[illegible] begun in late 1956. This unit, wi[illegible] related equipment, is expected to c[illegible] about $24,000,000 and is scheduled [illegible] go into service in early 1959. T[illegible] construction budget for 1957 tot[illegible] about $19,000,000 of which $10,45[illegible] 000 is earmarked for the second ge[illegible] erating unit at Bay shore station.

The Tucson Gas, Electric Lig[illegible] and Power Company, Tucso[illegible] Ariz. Net additions of $3,443,3[illegible] were made to the electric proper[illegible] in 1956. During the past ten years t[illegible] company has invested more than $3[illegible] 000,000 in new generating plants, a[illegible] electric and gas distribution facilitie[illegible] However, the continuing growth [illegible] the area will require expenditures [illegible] excess of $43,000,000 during the ne[illegible] five years. Additional generati[illegible] capacity of 75,000 kw is now und[illegible] construction for operation in t[illegible] spring of 1958, and a second simil[illegible] unit is planned for operation in la[illegible] 1959 or early 1960. Construction e[illegible] penditures for the year of 1957 a[illegible] budgeted at $12,000,000.

Union Electric Company, S[illegible] Louis, Mo. Construction during 19[illegible]

(Continued on page 78)

ERA OF RECORD PROGRESS

• New highs again were established in important phases of PP&L's business in 1956, adding further to the postwar succession of new records. This continued progress coupled with greater efficiencies and the effects of two major mergers has brought about astonishing transition from PP&L, 1945 to PP&L, 1956.

	1945	1956
Electric Customers	438,679	690,612
Kilowatt-hour Sales	2.5 billion	6.5 billion
Electric Revenues	$48 million	$126 million
Total Utility Plant	$181.9 million	$550.1 million
Generating Capability	490,550 KW	1,481,500 KW
Pole Miles of Lines	19,000	30,000
Number of Operating Employees	4,985	5,677

• Looking to continued progress, the Company's construction program over the five years 1957-1961 is anticipated at $193 million . . . or at the rate of three quarters of a million dollars a week, a rate even higher than for the 1945-1956 period.

PENNSYLVANIA POWER & LIGHT COMPANY

totaled $47,088,000 and was principally for enlarging and extending the transmission and distribution system to meet the expanding need of customers and to provide service for the 14,000 new electric customers. Some 9,000 line transformers were installed, 33 substations were built or enlarged, and more than 2,500 miles of wire were added. Reflecting the anticipated expansion of business, a record $63,000,000 is budgeted for the system's construction program in 1957—28 per cent more than in any previous year. During the next five years, total expenditures for new facilities are expected to exceed $330,000,000.

Utah Power & Light Company, Salt Lake City, Utah. Construction by Utah Power & Light and subsidiary, The Western Colorado Power Company, during 1956 required the expenditure of almost $16,400,000. About $7,900,000 was spent for production facilities; $2,900,000 for transmission lines and substations; and $5,200,000 for distribution facilities. The remaining $400,000 was spent for transportation equipment, general office requirements, acco ing machines and miscellaneous ite The year's largest single project the start on the second genera unit of the Carbon steam-elec plant in the Utah coal fields on wh more than $7,000,000 was expend This unit, scheduled for comple in August, 1957, will add 100,000 to the system. The companies e mate that the construction prog for the year 1957 will amount to proximately $21,769,000 for additi to property.

Virginia Electric and Pow Company, Richmond, Va. Dur 1956, investment in property plant reached the half-billion do point and at the end of the year tota $523,000,000. This is more than times the investment at the end 1946. Electric property additions counted for $42,149,000 or 95 cent of the total of $44,511,000 sp in 1956. The 1957 construction bud calls for a record expenditure of $7 000,000. Over half of the total be spent on new generating facilit Completion of the initial 150,000 generating unit at the Yorktown s tion and work on a second unit similar size is estimated to requ $18,921,000. When this second u is completed in 1958 a total of ab $48,750,000 will have been spent this location. A 150,000 kw additi to the Bremo power station will quire $12,470,000 in 1957 and at co pletion its total cost will run to $2 000,000. At Portsmouth power s tion, where the capacity is now 18 000 kw, a third generating unit w be added. This 150,000 kw unit scheduled for completion in 1959 a $2,672,000 will be spent in 1957.

The Washington Water Pow Co., Spokane, Wash. More th $22,300,000 was spent in 1956 for n and improved system facilities. T company's largest single constructi expenditure in 1956 ($14,830,24 was for work on the Noxon Rap hydroelectric project in western Mo tana. About 25 per cent complete the end of the year, this new pow project will begin delivering the fi of its 400,000 kw of energy by t fall of 1959. Estimated total cost, cluding transmission, is $84,000,00 The dam will approximately doub the company's present generati capability. It is estimated that $3 000,000 will be expended in 1957 a $72,000,000 from 1958 through 196

West Penn Power Compan Cabin Hill, Greensburg, Pa. Gro electric property additions duri

...l section of Kellogg's electronic computer.

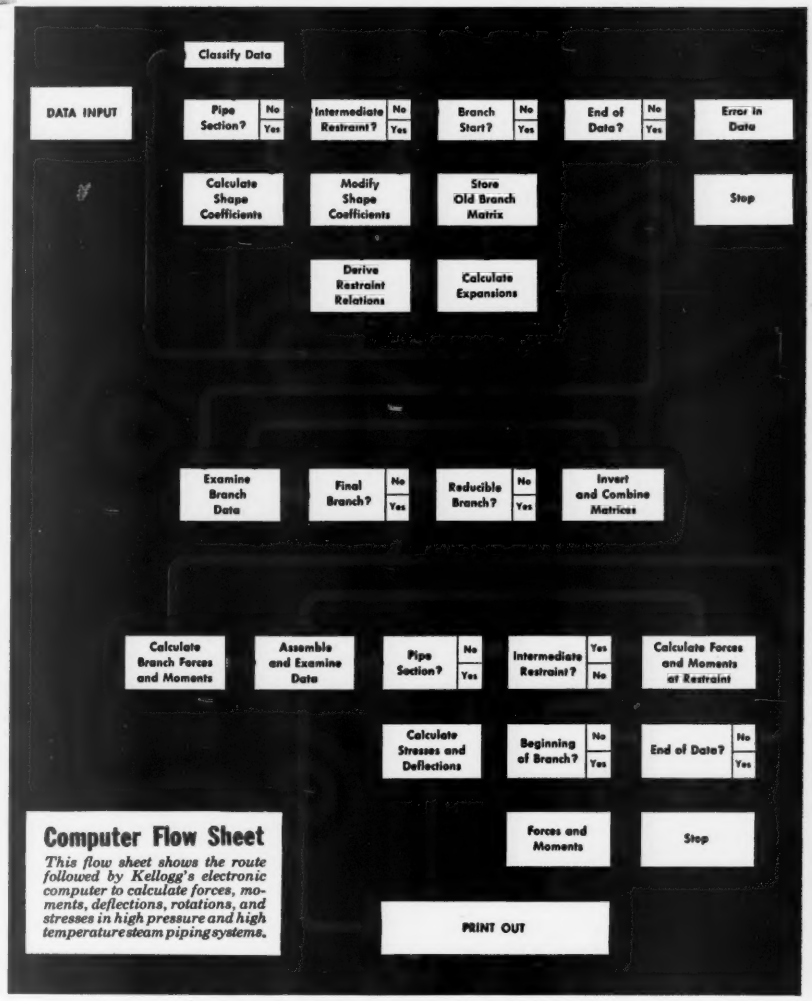
Electronic Route to Lower Steam Power Piping Costs

...ellogg's Digital Computer ...ermits More and Faster ...ccurate Flexibility Analysis of Complex Main ...nd Reheat Piping Systems

...PING PACE with the increasingly ...al pressures and temperatures ...e modern steam-electric power ...t are M. W. Kellogg's advanced ...niques for pre-determining ...sses and reactions of main and ...at piping. Most recent addition ...large magnetic drum digital com-...r, used to calculate forces, mo-...nts, deflections, rotations, and ...sses in complex piping systems. ...y enabling Kellogg engineers to ...ertake a far greater number of ...ulations in less time than ever ...re, electronic computation makes ...ible the ultimate or near ulti-...e piping system designs. Pipe ...e can often be shortened without ...rificing required margins of safety; ...ital investment and maintenance ...s reduced; operating efficiency ...reased.

...A pioneer in flexibility analysis ...niques, which include manual ...culations, model testing, and a ...ller electronic computer, Kellogg ...tinues its pioneering in the power ...ng industry by the addition of ...high speed computer to its New ...rk engineering facilities.

...A cordial invitation to see the ...W. Kellogg electronic computer ...work is extended to consulting ...ineers and to engineers of power ...erating companies and their ...ipment manufacturers. Appoint-...nts may be made through the ...es Manager, Fabricated Products ...vision.



Computer Flow Sheet

This flow sheet shows the route followed by Kellogg's electronic computer to calculate forces, moments, deflections, rotations, and stresses in high pressure and high temperature steam piping systems.

FABRICATED PRODUCTS DIVISION
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Compania Kellogg de Venezuela, Caracas

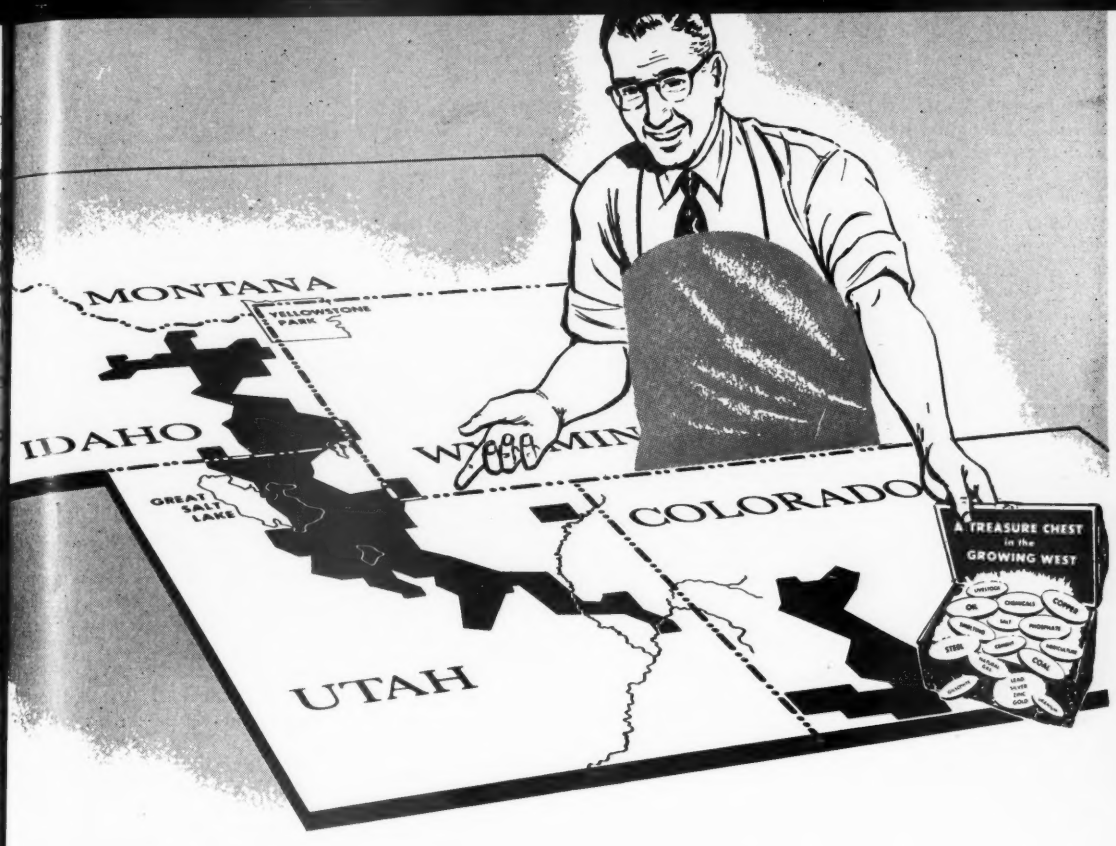
POWER PIPING—THE VITAL LINK

1956 were approximately $17,500,000. These included expenditures for new station additions to the major 132,000 volt transmission system, several new substations, increased distribution facilities, and a new division headquarters and service building at Washington, Pa. Construction started during the year on the new Armstrong generating station along the Allegheny river north of Kittanning, Pa. The first unit, 165,000 kw, is expected to be in operation in the spring of 1958 and a second, of about the same size, is scheduled for completion in 1959. Construction expenditures for 1957 and 1958 are estimated at $61,000,000 about half of which will be for the new Armstrong station.

The West Penn Electric Company, New York, N. Y. During 1956 two of the System companies began work on additional generating facilities. West Penn Power broke ground for its new Armstrong station along the Allegheny River north of Kittanning, Pa. The station is to have two units, each of about 165,000 kw. capability. The first is scheduled to go into service in the spring of 1958 and the second in 1959. Potomac Edison is adding a 75,000 kw unit in its R. Paul Smith station which will be in service in the fall of 1958. These new facilities will increase the system's installed capability to more than 2,150,000 kw. Gross property additions during 1956 amounted to about $31,000,000. Construction work in 1957 will reach an all-time high of roughly $55,000,000. About half of that amount is for the new generating facilities. The completion of two major plant additions in 1958 will also mean that construction planned for that year will be higher than usual —about $46,000,000.

Western Light & Telephone Company, Inc., Kansas City, Mo. Gross construction expenditures in the year 1956 amounted to $3,727,000. The principal projects constructed during the past year were the 69 kv transmission line from Cudahy, Kansas silica mine to Liberal, Kansas, and the 33 kv transmission line from Phillipsburg to Plainville, Kansas, which also provided an interconnection with The Central Kansas P
er Company. Substantial progress
made in 1956 on the constructio
the 20,000 kw capability electric
erating unit at the Fort Dodge po
plant located near Dodge City, K
sas. It is contemplated that this
erating unit will be in service in J
1957. The 1957 construction bu
calls for a gross construction cos
$5,173,000 of which $2,500,000 is
located to the Fort Dodge elec
generating Unit No. 3.

**Wisconsin Electric Power C
pany,** Milwaukee, Wis. Gross
ditions to electric, gas, heating
other property and plant in
amounted to $33,800,000. Of
amount, $30,100,000 was expen
for improvements and additions
electric utility plant. Of the total
pended for improvements to elec
utility plant, $7,100,000 was for g
erating facilities, $2,700,000 for tra
mission lines, substations and equ
ment and $18,200,000 for distri
tion lines, substations and equipme
Additions to other electric pr
erty and plant amounted to $2,1



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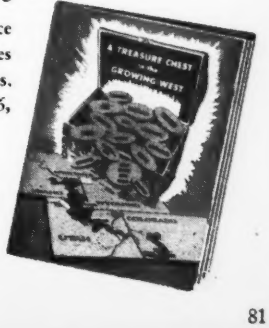
The catalog of raw materials occurring in "Treasure Chest" land—*mostly in enormous quantities*—lists practically every element in the atomic scale. Here in the vast Utah, Idaho, Colorado and Wyoming area served by Utah Power & Light Company, many well-known American firms have already begun to dig into new, fresh, almost unlimited sources of wealth. But they have barely scratched the surface. The potentialities merit the careful study of any industry seeking larger opportunity for today and the future.

Ask for copy of "A Treasure Chest in the Growing West"

Detailed information is presented in this Area Resource Brochure. Write, wire or telephone for a copy. Inquiries held in strict confidence. Address: W. A. Huckins, Manager, Business Development Department, Dept. 6, Utah Power & Light Co., Salt Lake City 10, Utah.



UTAH POWER & LIGHT CO.

A Growing Company in the Growing West

000. Good progress was made in 1956 on the construction of a fourth generating unit at the Oak Creek power plant. The fourth unit is expected to be in service by the end of 1957, bringing the total capacity of that plant to 500,000 kw. Plans for this fifth Oak Creek unit were announced as part of a current $300,000,000 expansion program which contemplates doubling the capacity of service facilities within a 10-year period in order to handle expected demands for electric service.

Wisconsin Power and Light Company, Madison, Wis. Construction expenditures for 1956 were $8,372,000. Of that amount, $7,255,000 were for electric facilities. The 1957 construction budget totals $12,717,000. Of this amount, $2,000,000 is for the Nelson Dewey generating station, to be located on the Mississippi river north of Cassville, Wisconsin. This plant, scheduled for completion in 1959, will have an initial capability of 100,000 kw which will cost an estimated $18,800,000. This additional capacity will also require large future expenditures for transmission and distribution purposes.

Wisconsin Public Service Corporation, Milwaukee, Wis. [illegible] construction expenditures du[ring] 1956 totaled $7,700,000 most of w[hich] provided extensive additions and [im]provements to electric and gas tr[ans]mission and distribution system[s]. [A] number of important projects [were] undertaken during the year. W[ork] was started on the 75,000 kw [unit] 500,000, addition to the Pulliam st[eam] plant at Green Bay. It is estim[ated] that construction expenditures in 1[957] will amount to $11,400,000. This [will] include approximately $2,700,000 [for] work on the 75,000 kw addition [to] the Pulliam plant.

New Type Fuel For Nuclear Reactors

SCIENTISTS at the Argonne [illegible] tional Laboratory have develope[d] new type fuel potentially useful [in] nuclear power reactors.

For the first time, Argonne is us[ing] ceramic pellets of urania-thoria [fuel] constituents to produce heat for e[lec]tricity from a nuclear reactor.

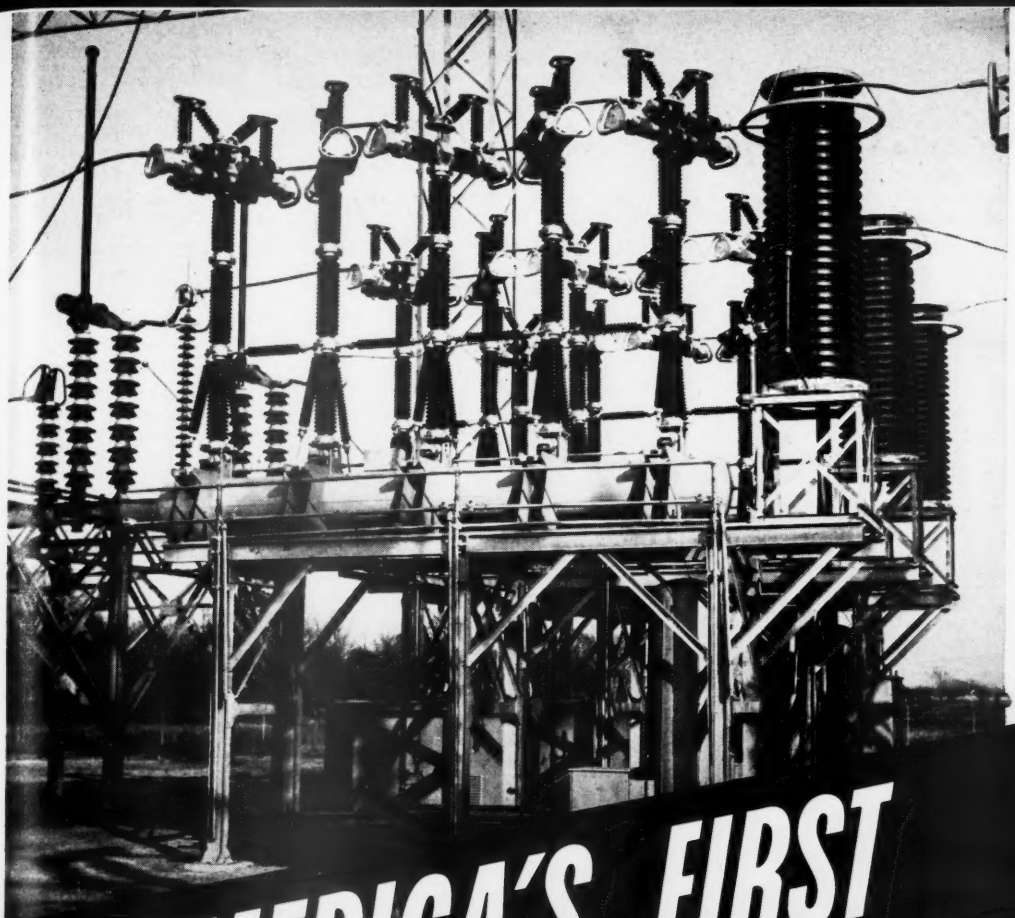
The development work was d[one] at the Laboratory's main site at [Lem]mont, Illinois. The pellets are n[ow] being used in a Borax series exp[eri]mental reactor at Argonne's bra[nch] at the National Reactor Testing S[tat]tion site near Idaho Falls, Idaho.

The core is composed of oxides [of] thorium and uranium. Both thori[um] oxide and uranium oxide have b[een] used in ceramics for many years, [but] the use of thorium and uran[ium] oxides as nuclear fuels has not b[een] tried before.

One of the major reasons for [the] use of ceramics as fuel elements i[n a] reactor is that they do not, like me[tal]lic fuel elements, grow and beco[me] distorted under intense irradiati[on]. Under some conditions, metallic f[uel] elements have been known to dou[ble] in length. Due to the airtightness [de]manded of reactors to hold in rad[io]activity and because of possible m[e]chanical failure, such physical chan[ge] can be dangerous. Ceramic fuel e[le]ments offer a way to prevent many [of] the problems due to metallic grow[th] under fission.

Crystal studies of uranium sh[ow] marked changes in size and structu[re] of the crystal under irradiation. T[he] rolling of uranium metal tends [to] unify the crystals in a single dir[ec]tion. When a majority of the crys[tals] lie in one direction the changes due [to] irradiation are enormously increa[sed] in that direction. Since ceramic cr[ys]

(*Continued on page 84*)



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tals lie in all directions, the effect of irradiation on a ceramic nuclear fuel element is much less than on a metallic fuel element.

The feasibility of using ceramic oxide fuels in a boiling water reactor is the problem which is discussed in this paper by Hoenig, Handwerk, Kittel and Breden. Results are given of the preliminary studies of the effects of irradiation on the uranium and thorium oxides.

The ceramic specimens prepared were tested both with and without an outside protective metal covering. Aluminum nickel alloy, stainless steel and zircaloy-II coverings were used on some specimens. Some of each kind of covered and uncovered ceramic elements were put in water or in sodium-potassium liquid metal and irradiated. The various fuel elements showed good resistance to corrosion in either water or sodium-potassium. (Corrosion resistance is an important factor in any material put inside a nuclear reactor.)

The results of the tests indicated that a ceramic core consisting of a mixture of uranium oxide and thorium oxide pellets, when sintered (fused) together and assembled in an aluminum high nickel covering will furnish a suitable material to be placed in a nuclear reactor.

The reactor for which the ceramic fuel was designed is the Borax-IV reactor, operated by the Argonne National Laboratory at its Idaho branch. The Borax-IV reactor is a modification of the famous Borax-III reactor which lighted the town of Arco, Idaho, during the night of July 17, 1955. This was the first time that a city in the United States was lighted by power from a nuclear reactor. This significant achievement was reported by American scientists attending the Geneva "Atoms for Peace" co ence in 1955. During the life o Borax-III reactor a total en output of 600,000 kilowatt days achieved.

The Borax-IV ceramic core, in operation, was designed to among other things, the operati a boiling water reactor under extreme heat transfer conditions the previous Borax cores. I tests have shown that the ceramic ments can operate satisfactorily quite high levels of power output unit volume of core.

The Borax series of reactors been important in leading to the sign of the first operating power actor in the United States, the Exp mental Boiling Water Reactor a Laboratory's Lemont, Illinois, Already six commercial reactors being based on this successful p reactor experiment.

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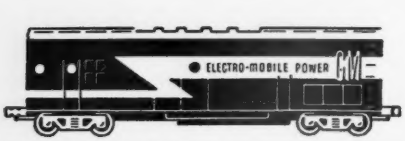
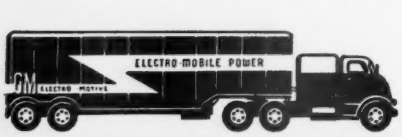
Moreover, the placement of Electro-Mobile Power close to the load not only relieves the central station of a block of power, but also reduces the line loss between the central station and the load for that block of power. This is a major factor at time of peak.

Just how flexible can service get? Far more flexible than you might imagine with present equipment if Electro-Mobile Power is employed to answer additional requirements. A joint analysis of your system can reveal the savings and increased flexibility possible with these units. Contact your Electro-Motive representative for full information.

Electro-Mobile Power adds to system flexibility in many ways

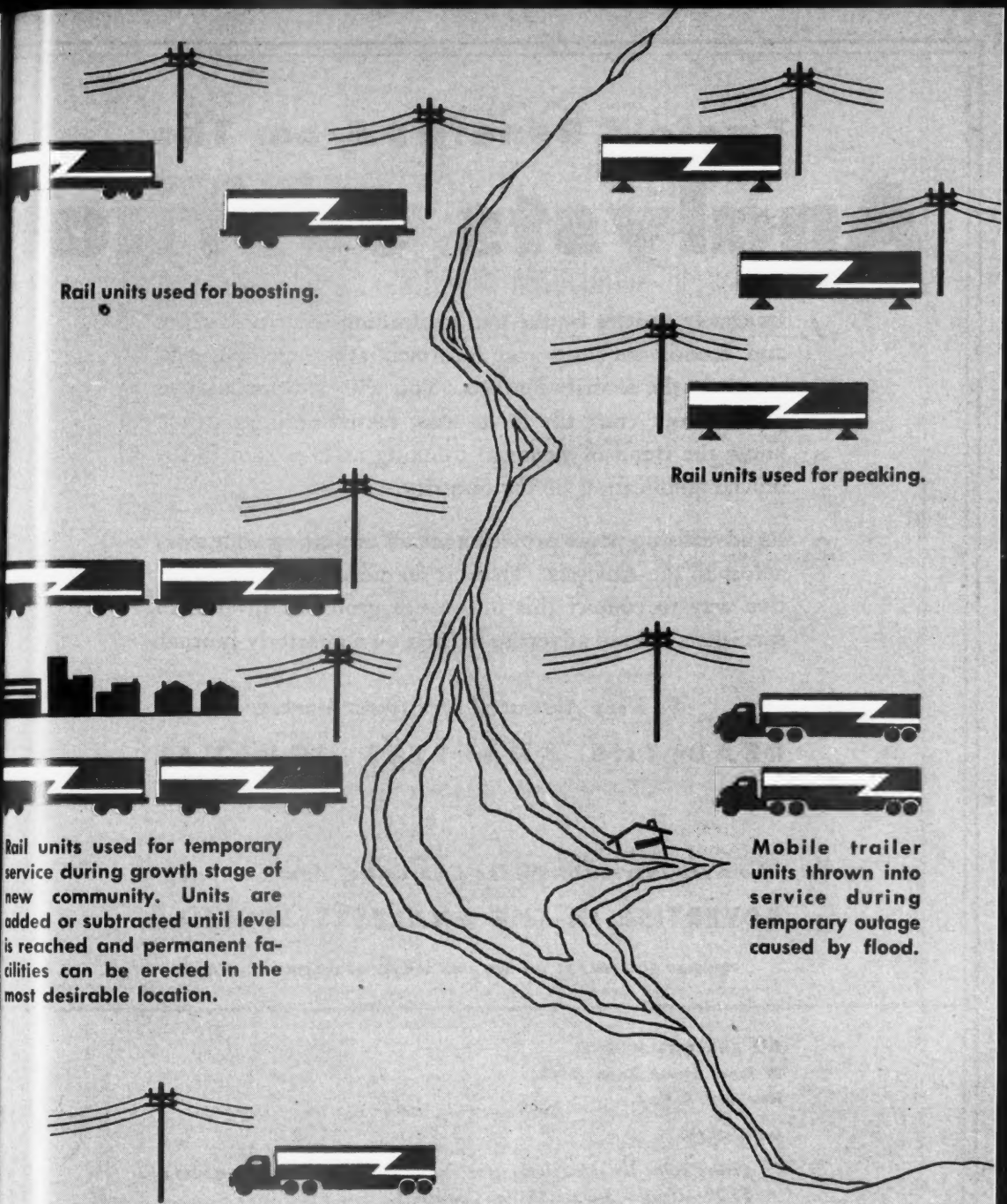


RAIL CAR—1000 kw units for use on sidings or placed on piers for semi-permanent use.



TRUCK TRAILER—500 kw units offer excellent mobility for many temporary applications.

Representative electric utility companies across the country are now providing better service to customers through the use of Electro-Mobile Power. This diagram is a composite of the different jobs these units, both truck-trailer and rail, are performing. Detailed information on these applications—operating costs, KWH produced, reason for use, location, etc.—are available through your Electro-Motive representative.



Rail units used for boosting.

Rail units used for peaking.

Rail units used for temporary service during growth stage of new community. Units are added or subtracted until level is reached and permanent facilities can be erected in the most desirable location.

Mobile trailer units thrown into service during temporary outage caused by flood.

Mobile trailer units being used during line relocation resulting from new highway construction.

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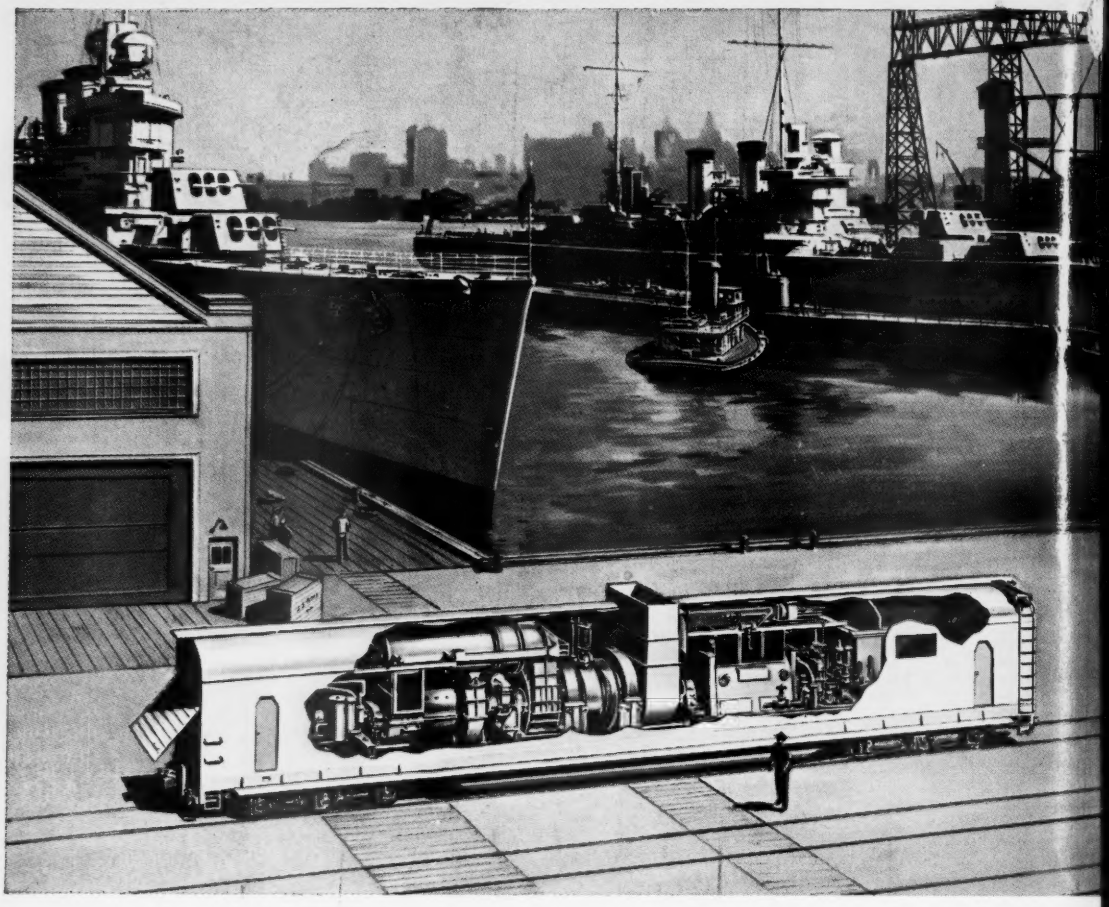

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